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ABSTRACT

This is the report of the third phase of a multi-phase project designed to develop an inventory of documented accomplishments for graduate student selection. The material developed in earlier stages was pilot-tested in Phase Three in 26 departments that represented the fields of English, biology, and psychology. The major purpose of this study was to investigate the instrument developed in Stage Two in terms of technical soundness, and the feasibility of its use in the admissions process. This study represents the transition of the use of documented accomplishments to predict graduate school achievement from a research phase to a more operational phase during which the instrument would be tested in actual admissions situations. The departments were asked to administer the instrument to their newly enrolled graduate students. Straightforward descriptive and correlational analyses of the responses to the inventory were conducted to describe characteristics of the students and the instruments and identify the most reliable clusters of items and indices of accomplishment. Students were followed up at the end of their first year to assess their graduate school accomplishments and their relationship to previous attainments. Students' reactions to the inventory were obtained by interview and by additional questions at the end of the inventory. (Author/CM)

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GRADUATE RECORD EXAMINATIONS

THE INVENTORY OF DOCUMENTED ACCOMPLISHMENTS FOR GRADUATE ADMISSIONS: RESULTS OF A FIELD TRIAL STUDY OF ITS RELIABILITY, SHORT-TERM CORRELATES, AND EVALUATION

Leonard L. Baird
Joan E. Knapp

GRE Board Research Report GREB No. 78-3R
ETS Research Report 81-18

August 1981

This report presents the findings of a research project funded by and carried out under the auspices of the Graduate Record Examinations Board.

EDUCATIONAL TESTING SERVICE, PRINCETON, NJ

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GRE BOARD RESEARCH REPORTS
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Altman, R. A. and Wallmark, M. M. A Summary of Data from the Graduate Programs and Admissions Manual. GREB No. 74-1R, January 1975.

Baird, L. L. An Inventory of Documented Accomplishments. GREB No. 77-3R, June 1979.

Baird, L. L. Cooperative Student Survey (The Graduates [$2.50 each], and Careers and Curricula). GREB No. 70-4R, March 1973.

Baird, L. L. The Relationship Between Ratings of Graduate Departments and Faculty Publication Rates. GREB No. 77-2aR, November 1980.

Burns, R. L. Graduate Admissions and Fellowship Selection Policies and Procedures (Part I and II). GREB No. 69-5R, July 1970.

Centra, J. A. How Universities Evaluate Faculty Performance: A Survey of Department Heads. GREB No. 75-5bR, July 1977. ($1.50 each)

Centra, J. A. Women, Men and the Doctorate. GREB No. 71-10R, September 1974. ($3.50 each)

Clark, M. J. The Assessment of Quality in Ph.D. Programs: A Preliminary Report on Judgments by Graduate Deans. GREB No. 72-7aR, October 1974.

Clark, M. J. Program Review Practices of University Departments. GREB No. 75-5aR, July 1977. ($1.00 each)

Donlon, T. F. Annotated Bibliography of Test Speededness. GREB No. 76-9R, June 1979.

Flaugher, R. L. The New Definitions of Test Fairness In Selection: Developments and Implications. GREB No. 72-4R, May 1974.

Fortna, R. O. Annotated Bibliography of the Graduate Record Examinations. July 1979.

Frederiksen, N. and Ward, W. C. Measures for the Study of Creativity in Scientific Problem-Solving. May 1978.

Hartnett, R. T. Sex Differences in the Environments of Gradaute Students and Faculty. GREB No. 77-2bR, March 1981.

Hartnett, R. T. The Information Needs of Prospective Graduate Students. GREB No. 77-8R, October 1979.

Hartnett, R. T. and Willingham, W. W. The Criterion Problem: What Measure of Success in Graduate Education? GREB No. 77-4R, March 1979.

Knapp, J. and Hamilton, I. B. The Effect of Nonstandard Undergraduate Assessment and Reporting Practices on the Graduate School Admissions Process. GREB No. 76-14R, July 1978.

Lannholm, G. V. and Parry, M. E. Programs for Disadvantaged Students in Graduate Schools. GREB No. 69-1R, January 1970.

Miller, R. and Wild, C. L. Restructuring the Graduate Record Examinations Aptitude Test. GRE Board Technical Report, June 1979.

Reilly, R. R. Critical Incidents of Graduate Student Performance. GREB No. 70-5R, June 1974.

Rock, D., Werts, C. An Analysis of Time Related Score Increments and/or Decrements for GRE Repeaters across Ability and Sex Groups. GREB No. 77-9R, April 1979.

Rock, D. A. The Prediction of Doctorate Attainment in Psychology, Mathematics and Chemistry. GREB No. 69-6aR, June 1974.

Schrader, W. B. GRE Scores as Predictors of Career Achievement in History. GREB No. 76-1bR, November 1980.

Schrader, W. B. Admissions Test Scores as Predictors of Career Achievement in Psychology. GREB No. 76-1aR, September 1978.

Wild, C. L. Summary of Research on Restructuring the Graduate Record Examinations Aptitude Test. February 1979.

Wild, C. L. and Durso, R. Effect of Increased Test-Taking Time on Test Scores by Ethnic Group, Age, and Sex. GREB No. 76-6R, June 1979.

Wilson, K. M. The GRE Cooperative Validity Studies Project. GREB No. 75-8R, June 1979.

Wiltsey, R. G. Doctoral Use of Foreign Languages: A Survey. GREB No. 70-14R, 1972. (Highlights $1.00, Part I $2.00, Part II $1.50).

Witkin, H. A.; Moore, C. A.; Oltman, P. K.; Goodenough, D. R.; Friedman, F.; and Owen, D. R. A Longitudinal Study of the Role of Cognitive Styles in Academic Evolution During the College Years. GREB No. 76-10R, February 1977 ($5.00 each).

The Inventory of Documented Accomplishments for Graduate Admissions: Results of a Field Trial Study of Its Reliability, Short-Term Correlates, and Evaluation

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Abstract

This is the report of the third phase of a multi-phase project designed to develop an inventory of documented accomplishments for graduate student selection. The material developed in earlier stages was pilot-tested in Phase Three in 26 departments that represented the fields of English, biology, and psychology.

The major purpose of this study was to investigate the instrument developed in Stage Two in terms of: 1) technical soundness, and 2) the feasibility of its use in the admissions process. This study represents the transition of the use of documented accomplishments to predict graduate school achievement from a research phase to a more operational phase during which the instrument would be tested in actual admissions situations.

The departments were asked to administer the instrument to their newly enrolled graduate students. Straightforward descriptive and correlational analyses of the responses to the inventory were conducted to: (1) describe characteristics of the students and the instruments; and (2) identify the most reliable clusters of items and indices of accomplishment. Students were followed up at the end of their first year to assess their graduate school accomplishments and their relationship to previous attainments. This information provided data for analyses of the short-term correlates of the measures. In addition, faculty were interviewed to determine the plausibility of the content of the instrument and the most accurate and operationally simple instructions and reporting formats. Students' reactions to the inventory were obtained by interview and by additional questions at the end of the inventory.

Introduction and Background

A basic purpose of graduate selection procedures is to select students who will be likely to be productive, creative, and provide leadership in their fields. In the selection process, graduate schools have always given attention to indications that students have made significant contributions to a field over and above the traditional academic qualifications. However, many admissions committees feel the need for a more systematic way to evaluate the learning and activities of students outside the classroom, so that they can select students who will be outstanding and who will eventually contribute most to the field. At the same time, aware of the changes in the nature of the applicant pool, they wish to have more appropriate selection procedures to evaluate the accomplishments of the older students, of unique and unconventional students, and of students from nontraditional programs.

This report represents the findings of Phase Three of a multistage project that was designed to meet these needs by developing procedures to assess the accomplishments of applicants to graduate school. In the first phase, trial instruments were developed after thoroughly reviewing other attempts at assessing accomplishments and carefully considering the issues involved. This earlier research showed that: 1) the best predictor of later accomplishment is earlier accomplishment, 2) these accomplishments are relatively unrelated to academic standing, 3) psychometrically satisfactory measures of earlier accomplishments, based on self report can be constructed, 4) these measures are fairly independent of the social class of ethnic status of students, 5) the measures can be used in practical admissions decisions, and 6) several alternative approaches to developing these measures can be used. (See the attached summary of research on the prediction of high level accomplishment for a description of this research.) Prototypes were developed based on three of these approaches: a checklist (Holland, 1961), a semidocumented approach (Shultz and Skager, 1963), and an open-ended portfolio (Knapp, 1975). In the second phase, an instrument was designed to meet the operational and conceptual requirements of an inventory of documented accomplishments for graduate selection using many of the positive features of earlier approaches in as simple a format as possible. This first version was reviewed by a diverse group of people concerned with graduate admissions for the purpose of finding answers to the following questions:

(1) How open-ended should the procedures be?
(2) How should the quality of accomplishments be evaluated?
(3) What should be the nature of the content?
(4) What is the best strategy for documentation?
(5) What is the best mode of delivery?

The work proposed for the third phase was based directly on the work of the previous phases. The first version of the instrument was revised on the basis of the review process in the second phase.

The inventory was administered to graduate students enrolled in 26 departments. The major focus of this stage was two-fold. First, in matters pertaining to the technical soundness of the procedures, the purpose is to obtain a first reading on the reliability and validity of such procedures in the admissions process.

Validity in this situation means the degree to which the items (accomplishments) reflect those attributes which are related to graduate school success and are acceptable to faculty and students in terms of relevancy to the admissions process.

Second, in matters pertaining to feasibility and development, the purpose of the study was to test the inventory in real-life situations in order to: 1) streamline and improve it by clustering and eliminating items, and by clarifying instructions and improving its format; 2) develop guidelines for the administration and use of the inventory; and, 3) identify the most useful and appropriate methods of analyzing and interpreting student responses and reporting the results of these responses to students and schools.

Depending on the findings of Phase 3, the fourth stage might include the administration of a refined instrument in a different group of departments. The long-term predictive validity of the assessment instrument could be examined against a variety of criteria of graduate school success. These criteria would need to be carefully constructed after thoroughly examining the meaning of short- and long-term success in the graduate school setting. In the fourth stage, operationally feasible procedures would be refined for possible use by the Graduate Records Examinations Board and/or by graduate schools. A more complete overview of the entire project and descriptions of project phases can be found in the GRE Board Research Report, GREB No. 77-3R by Leonard Baird.

Review of Relevant Literature

Recently, researchers have undertaken a wide variety of studies to determine the antecedents of high-level accomplishment in science, writing, creative arts, and leadership. This section summarizes some of this research, and shows that there is evidence that high-level accomplishment can be predicted with some success, even if we do not have a complete understanding of the process of achievement. Much of this research has been conducted in samples of college students or industrial researchers.

This review concentrates on studies of real-life criteria of accomplishment, following the guidelines of MacKinnon (1962). These include: (1) originality, uniqueness, or statistical rarity; (2) adaptation to reality, aiding in the achievement of some real-life goal, such as a scientific or aesthetic problem; and (3) sustained activity leading to the development, evaluation, and elaboration of an original idea. Studies based on such criteria as having a "creative" profile on a personality test, or other arbitrary classifications devised by a researcher will receive less attention.

Biographical inventories of earlier activity and accomplishment have been related to high level accomplishment in several populations: college students, high school students, scientists, and professionals in academic and professional practice. These studies will be reviewed in following sections.

They are presented here as evidence for the power of measures of accomplishment at one level to predict accomplishment at another. Their relevance to the graduate school will be discussed in the final section.

College students. High level accomplishment among students has been examined in many studies. As a natural outgrowth of their concern for talent, National Merit Scholarship Corporation reported a series of studies concerned with high level accomplishment. These studies include many significant relations between biographical information and achievement in college. "Achievement" consisted of such accomplishments as "Had a scientific or scholarly paper published (or in press) in a scientific or professional journal," "Received an award for acting, playwriting or other phase of drama," "Was editor or feature writer for collegiate paper, annual, magazine, or anthology, etc.," "Composed music which has been given at least one public performance," "Won a prize or award in an art competition, painting, sculpture, ceramics, etc." "Organized a college political group or campaign." Scales were developed for six areas: science, art, music, leadership, drama, and writing. In studies by Holland and Nichols (1964), and Nichols and Holland (1963), nearly every major test that has been suggested for the prediction of accomplishment was used in the predictor battery, including personality scales of all sorts, interest measures, assessments of cognitive styles, "creativity tests," and high-level ability tests. The best predictor of accomplishment in college was accomplishment in the same area in high school, as measured by simple check lists of nonacademic achievements. (Similar results have been found in a large sample study of more typical students [Baird, 1969a].) Other National Merit studies by Roberts (1965) and Nichols (1966) studied the item correlates of high-level accomplishment. Roberts developed scales for six areas of accomplishment: science, art, writing, music, leadership, and speech (as defined by the same sort of items described earlier). In general, more achievers in each area endorsed the items expressing interest, activity, or competence in each area than did the nonachievers. These items tended to be directly related to the kinds of accomplishments later exhibited in college. As Roberts states: "Many of the items in each scale were directly content-related to the area of criterion achievement, and a fair number were related to other specific areas of activity and achievement." For example, in the science scale, more than half of the positive predictors were "direct indicators of scientific activity or interest and several others may be "technological" in nature (e.g., photography, nature collections)." Nichols' correlations also indicated that previous behaviors were generally the best predictors of high level accomplishment in both a Merit sample and a sample representing a broad range of talent. (Biographical information about previous accomplishments was a better predictor than the personality, interest, or ability scales that Nichols also used in his study.) Other studies using large samples of average students have shown that scales measuring high school nonacademic accomplishment are the best predictors of later accomplishment in college and have sufficiently high correlations to be of practical use (Richards, Holland, and Lutz, 1967; Baird, 1969a). Ability, personality, and interest measures were generally poor predictors in these studies.

The need for measures of out of class accomplishment in addition to measures of academic accomplishment is evidenced by the fact that, in all these studies, there was little relation between grades, academic ability as measured by test scores, and later accomplishment. The need is further emphasized by the work of Wallach and Wing (1969) who replicated these studies in their study of Duke University students in which little relationsip between academic and nonacademic achievement was found using methods other than correlations. Baird (1968) similarly compared bright and average students and found little average difference in their nonacademic accomplishments. Elton and Shevel (1969) further clarified the issue by examining individual items on the ACT scales of accomplishment and finding that some out-of-class accomplishments were related to measures of academic talent but about an equal number showed a negative or no relationship.

High school students. The studies of high school students provide somewhat indirect evidence of the power of measures of previous accomplishment to predict later accomplishment. They are reviewed here because they show that previous activity and experiences which are related to accomplishment are predictive of later accomplishment, as well as earlier accomplishment, per se. Long-term activity and interest in an area may not result in publically recognizable accomplishments, but they do show that behaviors consistent with later accomplishment are important; accomplishment does not appear overnight.

Schaefer and Anastasi (1968), and Anastasi and Schaefer (1969), developed biographical inventory keys against criteria of creative accomplishment among high school boys and girls. Separate keys were developed for (a) science and (b) art and creative writing, and cross validated in second criterion groups. Cross-validated validity coefficients among the boys were .35 and .64 for the science and art-writing scales, respectively, For girls, art and writing were predicted in a cross validation with correlations of .34 and .55, respectively. Using a similar biographical inventory and the same sample, Schaeffer (1969) was able to predict creative performance in art for boys (.65), writing for girls (.55), and, in combination with personality scales, science for boys (.48) and art for girls (.55). In their discussion of the contents of these scales, Anastasi and Schaeffer (1969) pointed to the common characteristics of high performing adolescents (with some support from other studies). These were: continuity and pervasiveness of interest in the students' chosen field; prevalence of unusual, novel, and diverse experiences; and the educational superiority of the students' family background. The first point deserves some reemphasis. Two studies (Baird, 1968, 1969b) indicate that accomplishment often begins in adolescence or before in exploratory activity, often resulting in recognized achievement. Baird and Richards (1968) and Baird (1969b) found that such accomplishment seldom begins in college; there are few "late bloomers." The great majority of students who show accomplishments in college showed similar activities in high school. Anastasi and Schaeffer (1969) point out:

> Typically, the highly creative adolescent girl in this study had manifested an absorbing interest in her field since childhood and her creative activities had received recognition through exhibitions, publication, prizes, or awards. Her initial interest was thus reinforced and reinforced early in life by persons in authority, such as parents and elementary school teachers.

Similar results are reported in studies of industrial scientific and professional samples, reviewed in the following section.

Predicting high level accomplishments among scientists and other adult groups from biographical records of accomplishment and activity. Biographical variables both dealing with past accomplishments and past activity and interest similar to those just described have been found to characterize scientists who have demonstrated a high level of accomplishment. For example, Roe (1953) found many unusual biographical characteristics of scientists in her sample. Kulberg and Owens (1960) and Morrisson, Owens, Glennon, and Albright (1962) found that biographical information correlated with the creativity, professional interest, and research competence of engineers and scientists. Albright and Glennon (1961) found that biographical variables distinguished between supervisory and research oriented scientists at all levels of a laboratory organization. Smith, Albright, and Glennon (1961) also found that biographical information predicted rated scientific competence, rated creativity and number of patents within a group of research scientists. These three criteria were predicted in a cross-validation sample with correlations of .61, .52, and .52, respectively. The content of the items suggests high self-confidence and high self-conception. "This interpretation is reinforced by the frequency with which the high criterion groups say that they (a) have more readily taken advantage of opportunities presented them, (b) consider their achievements thus far to be greater than those of others with the same education, (c) work more quickly than others, and (d) prefer to have many things 'on the fire' simultaneously." It might be noted that these descriptions are based primarily on answers to factual questions about the scientists' accomplishments. Chambers (1964) used both biographical and personality test variables to study creativity in chemists and psychologists. Three personality scales and 16 biographical items were significantly related to the criterion of creativity. The more creative scientists more often had fathers who were professional men, graduated from high school earlier, spent more hours per week (more than 50) in study and research in graduate school, published more articles then, and more often met their graduate school expenses by scholarships and fellowships than by part-time work.

McDermid (1965) found that biographical variables were the best predictors of supervisory and peer ratings of high level (in this case, creative) performance. McDermid also used personality tests (the California Psychological Inventory and the Adjective Check List) an interest test (The Vocational Preference Inventory) a high level intelligence test (Concept Mastery Test), the Social Insight Test and Welsh Figure Preference Test. All these tests had been used in other studies of creativity, but were not useful in McDermid's sample of engineering personnel. McDermid concludes "The correlations obtained in this study between paper and pencil tests and the criteria of creativity were so low as to be virtually useless for predictive purposes; biographical data, on the other hand, proved to be significant as predictors of both supervisory and peer ratings of creativity. This finding, of course, is quite consistent with the practical dictum that the best predictor of future performance is past performance. . ."

Taylor and Ellison (1967) summarized eight years of work on the identification of biographical predictors of scientific performance. In the last NASA scientist samples the cross-validated correlations with ratings of creativity were .41, with the number of publications .62, and with GS level, .72. The factors in the Taylor and Ellison study were consistent both with other studies of accomplishment in science and the studies of students just summarized. The highly performing scientists, as the students, tended to have a conception of themselves as capable of high level professional performance, are independent of others' opinions, have great dedication to their work, work very hard, have clear ideas of their goals, which they set at a high level, and are intellectually oriented, a trait that developed early in adolescence.

Finally, Munday and Davis (1974) have shown that biographical accomplishment scales administered in high school predicted adult accomplishment six years later. The adult accomplishments included such things as "was author or coauthor of scholarly or scientific article accepted for publication in a popular or professional journal or presented as a public lecture," "received an award for acting or some other phase of drama," "sold one or more works of art to collectors, museums, or the general public," "won a literary award or prize for creative writing," "composed or arranged music which was publicly performed," and "been a candidate for election to school board, city, county, or state office."

The median correlation between the high school accomplishment scales and the corresponding adult scales was .25 for men and .26 for women when graduates and nongraduates were combined. In contrast, the median correlation between high school grades and adult accomplishments was .03 for men and .00 for women, and the medians correlation between ACT composite scores and adult accomplishments was .06 for men and .10 for women. The median correlation between college grades and adult accomplishments was .09 for all students combined. This study is important because it shows the long range validity of the biographical accomplishment scales, even after the intervention of college and work, and illustrate again their superiority over other measures.

In sum, studies we have reviewed support the conclusions reached by Baird (1969a):

> There is some consensus, then, that students who later achieve . . . (in creative activity, as well as academic activity) have engaged in activities and developed skills related to that area, have conscious goals and desires to achieve in that area, and describe themselves as having ability in that area.
>
> . . . The achiever . . . has a history of activities and achievements related to his present achievement. He is motivated to achieve in this area and accurately assesses his own talents. Perhaps rather than attempting to develop new scales to describe some universal creative mind, psychologists should concentrate on the development of more accurate and reliable measures of past activities, goals, and self-description.

These results and those of the student samples suggest that measures of accomplishment could be used for the early identification of students with the potential for high level accomplishment, and as one of the bases for selecting students for special programs. In most of these studies, biographical information about past accomplishment was the best predictor of later performance, better than ability, interest or personality tests, suggesting the power of these variables for particular purposes.

Some Questions About Direct Assessment of Biographical Accomplishment Scales

We have just seen the power of biographical accomplishment information to predict subsequent high level accomplishment. The studies just reviewed indicate that this information is considerably more useful than most other kinds of information. However, before we consider using this kind of data in practice we need to answer four questions about it: (1) can we believe students' reports?, (2) can measures be constructed which meet stand psychometric criteria, (3) how would such measures be used in real-life selection situations, and (4) are such measures fair to students from disadvantaged backgrounds?

The Validity of Direct Measurement per se

Probably the most critical issue in the use of reports of accomplishments is whether we can believe a person's responses. There is some evidence that these reports can be believed. However, it may be useful to first consider the general question as to whether one can believe what people say on questionnaires, since this bears on the general validity of questionnaires concerning accomplishments. The problem is, simply, beyond obvious and innocuous information such as their vocational choices or hometown size, can or will people give accurate accounts of their history and present status? The studies of the validity of self-report provide a fairly consistent answer to our question. Mosel and Coyan (1952) reported high validity for application blank work histories in industrial settings. They found a high level of agreement between the claims made by job applicants and the reports of past employers with respect to weekly wages, duration of employment and job duties. All correlations except one were .90 or greater. Hardin and Hershey (1960) found that when workers' reports of their wages on a questionnaire were checked against company pay records, the worker and company figures correlated .98 among women, and .99 among men. About eight percent of the sample under- or over-stated their pay by plus or minus six percent. Interestingly, about three times as many employees understated their pay as overstated it. Clausen (1968) compared self-reports of voting in elections to official records and found an "invalidity" rate of approximately 6.9 percent. He cautions that this may be an overestimate, for "All errors that lead the investigator astray in tracking down the record of the respondent's vote, e.g., incorrectly spelled name, incorrect address, have the one sided effect of challenging the validity of the respondent's vote report." This is a very important point to remember in every study of the validity of self-reports. One should not simply assume 100 percent accuracy in official records and the reports on those records.

Calahan (1968) asked a number of Denver adults questions ranging from whether they had a phone in their homes to whether they contributed to the Community Chest. The self-reports on many factual questions were quite accurate. After a variety of analyses, Calahan noted that accuracy was higher for items concerned with recent facts. Calahan concluded that respondents generally will give accurate responses even when it may reflect on their prestige, provided that the question of fact concerns the respondent's recent activities rather than past events.

In samples of college students, Walsh (1967, 1968, and 1969) has found that students generally provide accurate reports of their past behavior, even when items deal with sensitive issues such as failing courses. However, Calahan's comments seem to apply to college students, as well. Thus, Walsh's students seemed to have a little difficulty recalling remote or insignigicant events, but, ". . . if an error of plus or minus .20 was permitted in a students report of his previous semester GPA, then the percentage of accuracy would be 100 percent." Overall, Walsh found a very high level of accuracy. In addition, Walsh did not find any difference in accuracy between interview, questionnaire or "personal data blank." In his later studies, Walsh found that the level of accuracy of self-report was not changed when students were given financial or social incentives to distort their self-report. Studies of the validity of self-reported grades reviewed by Baird (1976) also generally indicate that students provide quite accurate information about themselves.

Let us now turn directly to measures of accomplishment. As part of a comprehensive study of the accuracy of self-reports on a questionnaire administered with a national college testing program, Maxey and Ormsby (1971) studied the agreement between student-reported and school-reported nonacademic achievement on 28 items. (They also studied the accuracy of self-reported grades, and reached the same conclusions as did Baird, 1976, that students usually give very accurate reports of their grades.) Their sample included 5775 students completing the ACT battery. Their reports were checked with school reports in 134 high schools. The achievements were in athletics, leadership, music, speech, drama, art, writing, and science, and included such items as "Edited a school paper or yearbook" and "Placed first, second, or third in a regional or state science contest." The average level of agreement between student report and school records was about 90 percent. But this did not mean that 10 percent of the students were exaggerating. On the typical item only about 6 percent of the students claimed an accomplishment for which the school had no record. For the other four percent of students, the school credited them with an achievement they did not claim. The items on which there was greatest agreement tended to be highly visible, easily verifiable items such as "Placed first, second, or third in a regional or state speech contest." Conversely, the items on which there was less agreement tended to be behaviors about which the school would have little information, such as "Actively campaigned to elect another student." No systematic differences in agreement were found when the data was broken down by sex or family income level. Students who made better grades tended to be slightly less accurate than those who made lower grades. The authors think this may be due to a tendency for students with higher grades to be more active in school social activities in ways unknown to school personnel. The fact that the students' reports of achievement were gathered while they were completing a national assessment for college admission leads one to expect them to be exaggerated. The fact that they tended not to be adds strong support to the idea that self-reports are accurate.

A great deal of other evidence on the validity and utility of self-report measures is reported in Baird (1976).

In summary, from the evidence available, it appears that questionnaire responses have useful validity. More particularly the validity of questions about past accomplishments appears useful enough for the decisions and actions that they could be used for.

Can biographical measures of accomplishment be made psychometrically adequate? The studies of the scales developed by the National Merit Scholarship Program (Nichols and Holland, 1964), the research on more average college students (Richards, Holland, and Lutz, 1967; Richards and Lutz, 1968) and the operational work of the American College Testing Program (ACT Technical Report, 1973) show that biographical accomplishment scales can be constructed with adequate reliability. Occasional skewness in the scales does not present a serious limitation (Holland and Richards, 1967). The validity of the scales does not seem to be affected by restrictions of range on academic talent (Holland and Richards, 1967; Baird, 1969a). The validity of the scales, discussed earlier in the review also indicates the psychometric adequacy of the scales. All of the results may be underestimates because of the brevity of the scales used in these studies. In sum, it appears that biographical accomplishment scales can be constructed which meet standard psychometric requirements.

Can biographical accomplishment scales be used in practice? Biographical accomplishment measures have seldom been used in real-life studies of the selection of college or graduate students so there are few guidelines for the person who would like to make use of these variables. A few industrial studies provide some stimulating suggestions, but these are few and far between. Certainly, very few, if any, colleges or graduate institutions have made past extra-academic accomplishment the most important basis of their selection procedures. However, a study by Baird and Richards (1968) simulates what would happen if various selection procedures were followed for admission to college and this study suggests some of the practical problems using accomplishment data in selection decisions. The authors compared the results if: 1) only academic criteria were used to admit students to college; 2) only criteria based on previous creative accomplishment in each of six areas were used; and 3) both academic and creative accomplishment were used. A close examination of the study leads one to the conclusion that an educational institution cannot have everything. For example, if an institution selected students only for high level accomplishment rather than for grades, it would increase its dropout rate. However, an institution could still make use of nonacademic predictors of creative accomplishment. For example, as Baird and Richards suggest, ". . . a college could decide which areas of achievement it wished to emphasize; that is, whether it preferred more or fewer students with potentials for achievement in leadership or science, art or writing, speech and drama or music." In short, a college or graduate school can obtain a group of students who will fit its purposes and goals to a reasonable extent.

Are the measures fair to disadvantaged students? One fundamental concern about these measures is whether they are fair to students who may not have had opportunities for accomplishment. If they have not had a chance to engage in various activities, or attended institutions lacking in appropriate facilities, they would be expected to appear lacking in accomplishments. The evidence on this point indicates that students from disadvantaged backgrounds do about as well on assessments of their real-life accomplishments as do other students. For example, Baird (1967) compared students from families with different incomes in a national sample of 18,378 college bound students. The groups ranged from "below $5,000" (approximately the lowest quarter of incomes in the national distribution at the time of the study) to "25,000 and above" (approximately the top one or two percent). The differences between the groups were very small and, in the case of higher levels of achievement, virtually nonexistent. In a second study, Baird (1969c) studied the relationship between family income and educational ambitions in a national random sample of 15,535 college bound students. Although educational ambitions were significantly related to accomplishments in several areas, family income was not. That is, students from families with different incomes did not significantly differ in the number or level of accomplishments they reported. (It is important that both studies showed significant differences among the income groups on measures of academic ability.) These results suggest that the accomplishment measures do not discriminate against disadvantaged students, although disadvantaged students do score lower on academic ability tests.

Studies of the large samples of college freshmen, obtained by the American Council on Education also show that Black students report just as many accomplishments of the kind we have been discussing as do White students. Bayer and Boruch (1969) compared the high school accomplishments of 12,300 Black college freshmen with those of 230,582 non Black students enrolled in 358 colleges, and found no differences. Bayer (1972) found the same results when he compared the accomplishments of 12,927 Blacks with 158,111 non Blacks in 324 colleges. These results held in all types of institutions. In short, the evidence indicates that reports of accomplishments do not discriminate against disadvantaged or minority students. In fact, since these studies were based on reports of high school accomplishments, where one would expect any discriminatory effects to be much larger than in college, it seems logical to believe that there would be little, if any, difference among the attainments of graduate school applicants. (In fact, in the national sample of low and other income students studied by Holmstrom [1973], there were no differences in the college achievements she studied.)

Implications for a Graduate Admissions Inventory of Accomplishment

The implications can be stated fairly briefly. (1) Since the consensus of the studies indicates that information about past accomplishments is the best predictor of later accomplishments, graduate school admissions' committees who wish to select students with the greatest potential for future accomplishment should look for evidence of students' past accomplishments. (2) Satisfactory measures of past accomplishments have been constructed at other levels, so it seems plausible to believe that such measures canbe constructed at the graduate school admissions level. (3) The measures that have been constructed appear to have adequate reliability, accuracy, and validity, so it seems plausible to think that measures which are adquate in these ways can be developed for graduate school admissions. (4) The measures seem independent of academic aptitude, so similar measures for graduate school admissions would probably add a good deal of information of a new kind to the admissions situation, and (5) studies simulating the use of these measures show that different selection strategies produce different results, so graduate schools should not see these measures as panaceas, but as a new kind of information.

Summary

We have found biographical accomplishment information to provide useful prediction of later high level accomplishment in a wide variety of samples and settings. In these studies, no other class of variables proved nearly so useful. The information seems believable, it can be psychometrically adequate, and it can be used in various selection strategies. A strong case can be made for the utility and value of biographical accomplsihment information.

Procedures and Sample

The major procedures used to carry out the purposes of the study were: (1) selecting an advisory panel; (2) refining the first version of the inventory; (3) developing interview schedules for students and staff and a follow-up questionnaire; (4) developing a general plan for data collection including the selection of a sample of schools and departments; (5) collecting the data; and (6) conducting analyses to summarize student and faculty responses to the inventory and interviews.

Selecting the Advisory Panel

Since Phase Three was a research project requiring the cooperation of institutions outside ETS, a committee of external advisors was asked to guide the course of the work. They provided advice to researchers concerning the revision of the instrument, development of effective procedures for its use and selection of the sample of institutions. The following individuals agreed to serve on this panel:

Dr. Leo Berner, Jr.
Associate Dean of the Graduate College
Texas A & M University

Ms. Anne Fitzpatrick
Graduate Student
University of Massachusetts

Dr. Ronald Geballe
Dean of the Graduate School
University of Washington

Dr. Leslie Hicks
Professor, Department of Psychology
Howard University

Dr. John L. Holland
Professor, Center for the Study of the
Social Organization of Schools
Johns Hopkins University

Dr. Sybil Novinski
Associate Academic Dean & Registrar
University of Dallas

Dr. Rose-Marie Oster
Associate Dean of the Graduate School
University of Colorado

Dr. Cecelia Preciado-Burciaga
Assistant to the President
Stanford University

Mr. Stephen L. Wise
Graduate Student
University of Illinois

The members of the committee were appointed at the outset of the project and were sent information about research and development that occurred prior to Phase Three. In addition, they were asked to criticize the first version of the inventory and react to a tentative list of graduate schools that might be included in the field test.

Refining the Inventory

The first version of the inventory was reviewed by the research, test development, and Office of Minority Education staff from ETS, and the editorial staff of the GRE Board. In addition, the inventory was submitted to students at GRE Student meetings and to members of the GRE Minority Affairs Committee for their review. Finally, the project advisory panel was asked to criticize the inventory with the following major points in mind:

1. Format-

    Is the format easy to read and interpret or confusing? How can it be improved? Are directions clear?

2. Language-

    Is the wording clear and the grammar correct?

3. Content-

    Does the content of the inventory follow from the objective and rationale of the project? Is the content "face valid" for young as well as older adults, minorities, women, etc.? Is anything in the inventory offensive?

4. Utility-

    Any suggestions for boosting the inventory's utility in the graduate admissions process? Will students find this inventory interesting and useful to them in presenting their achievements?

Major criticisms from reviewers of the first version of the inventory were:

1. The inventory was unwieldy, bulky, and difficult to handle, and therefore took too much time to read.
2. Sections were confusing because they did not seem to follow a particular rationale.
3. The content of some items in different sections appeared to be redundant.
4. The directions were confusing.
5. There were inconsistencies in the language of some of the items.
6. The tone of many of the items was too academic and the language of the inventory should be more down-to-earth.
7. There were not enough activities that would be likely to be undertaken by minority students.
8. There were too few "ordinary" accomplishments included in the inventory.
9. There were some questions about the importance of knowing whether these activities were part of a college assignment.
10. The inventory discriminated against older students since they may not remember details. Conversely, some reviewers said younger students might be penalized because they did not have enough time to accumulate attainments.
11. The inventory would not be useful to faculty, unless a cogent summary report was available as part of the service.
12. Students, in general, found the inventory interesting but intimidating since they felt inadequate if they could not find something they had done.

Many of these comments were heeded when developing the second version of the inventory (Appendix A). The following changes were made:

1. The inventory was converted to a booklet with a less complex format.

2. The number of sections was reduced, and some items were deleted.

3. Items were added reflecting minority interests.

4. Some new activities were added that reflected a more realistic level of accomplishment.

5. The directions were simplified.

6. The instrument was edited to ensure correct usage and to eliminate inconsistencies.

Biographical items were added to ascertain students' undergraduate major, sex, age, undergraduate grade point average, and minority status, to determine whether these characteristics were related to the kinds and number of activities they reported. An evaluation section was added for the purpose of obtaining students' reactions to the inventory and to specific items.

Developing a Follow-up Questionnaire and Interview Format

A follow-up questionnaire was developed by ETS researchers and subject matter specialists in the areas of English, biology, and psychology (Appendix B). This questionnaire was administered in the spring to the recently admitted graduate students who had taken the inventory in the fall. The purpose of this procedure was to study the short-term predictive power of the inventory. Students were queried about their perceptions of their success in their first year of graduate school, and what they had accomplished in terms of activities and products. These responses were later compared with the responses to the inventory to determine the strength and types of relationships between past and present accomplishments and activities.

Schedules were devised for the interviews planned with graduate deans, faculty, and students. The purpose of the interviews was to determine reactions to the inventory by the types of individuals who play important roles in the admissions process. Questions concerning the utility of the instrument in the admissions process and the feasibility of operationalizing such procedures were included in the interviews.

Developing a Data Collection Plan

ETS staff selected 12 graduate schools for possible inclusion in the study. Individual schools were selected in such a way so as to form a total group of graduate schools that reflected the variety of graduate schools in general. Care was taken to include schools that offered graduate programs in all three subject areas whenever possible. This list was sent to the members of the project advisory committee for their review. The committee was asked to choose a sample of schools with the following criteria in mind:

1. Prestige rank of biology, psychology, and English departments.

2. Geographical diversity.

3. Degree of centralization in the graduate school.

4. Control of institution.

5. Size of school and/or departments.

The following schools were chosen for inclusion in the study:

Arizona State University
Brandeis University**
Duke University
Howard University**
Louisiana State University**
Rutgers University**
Southern Illinois University**
Stanford University
Texas A & M University**
University of Michigan
University of Pennsylvania
University of Washington

The final sample used in the study contained the same number of schools as submitted to the committee since some schools were deleted and some added as a result of the committee's advice.

**These schools were visited by project staff.

Graduate deans of these universities were invited to participate by the chairman of the GRE Board, and to appoint a campus coordinator. Upon consenting to participate in the project, campus coordinators were sent instructions and a packet of inventories. Inventories were distributed and collected by the coordinators, who returned the instruments to ETS for analyses. In the spring the follow-up questionnaires were distributed by the coordinators to students who took the inventory. Students returned these questionnaires to ETS by mail on an individual basis.

Interviews with graduate deans, faculty, and students (graduate and undergraduate) were conducted after the students responded to the inventory and before the followup questionnaire was distributed. At each school the graduate dean or associate dean, faculty members and graduate students representing the English, biology, and psychology departments were interviewed. In addition, undergraduates from each of the fields were invited to discuss the inventory and graduate admissions in general in a group setting with the visiting researcher.

Sample

Although all schools were initially eager to participate in the study, some could not complete all the tasks required of them. Delays and poor return rates resulted from various problems on individual campuses, ranging from the illness of a dean to academic calendars that were not synchronized with the project schedule. Two schools were unable to return the inventories.

The inventories were sent to the coordinator on each campus. The number sent depended on the coordinator's figures for the first-year graduate enrollments in English, biology, and psychology. In some cases these figures were probably estimates, and in others included part-time students, and in most cases were probably based on numbers at the beginning of the semester. To account for possible losses of surveys we sent an extra five per department. Thus, although we sent out over 800 inventories, they were intended for only approximately 650 students. Thus, the 308 processed inventories were probably representative of 50 to 65 percent of the actual enrollment. (An additional 25 inventories arrived after it was too late to process them.) A total of 308 inventories were collected from 26 departments in the remaining ten schools; 163 follow-up questionnaires were collected. Recovery rates for the follow-up survey varied from school to school. The lowest rate was 0 percent, the highest 62 percent. The follow-up questionnaire was distributed near the end of the school year, therefore the overall rate was lower than it might have been if the questionnaire had been distributed earlier.

In addition, partly because of some misunderstandings about the meaning of "confidentiality," it was not possible to match the inventory data with the data from the follow-up questionnaires for 21 cases. Thus, the short-term prediction study was based on 142 cases.

Characteristics of the sample. The sample included a wide variety of students, as shown in Table 1. There were approximately the same number of men and women. Although the absolute numbers of blacks and other minorities in the sample was small, the percentage was considerably larger than that in the total population of graduate students (Cabrera, 1978). The students varied widely in age and number of years since earning the bachelor's degree. Almost a quarter had had some previous graduate education. The most common educational goal was a doctorate or post-doctoral study, with about one in five seeking a masters degree. Just over half (53%) hoped to obtain a faculty position after completion of graduate school. Over two-thirds of the sample had worked during their last two years of college, and 81 percent had worked between graduation and entrance to graduate school, 37 percent full time for six months or more.

Analyses

Percentages of responses were calculated for the entire sample, and for groupings of students based on their fields, undergraduate grades, sex, ethnic group, and age. The percentages of students' responses to the detailed questions about each accomplishment were calculated, based on the students reporting such an accomplishment. The correlations among items were calculated, and an attempt was made to use this information to construct scales (i.e. groupings of accomplishments with similar content). The distributions, means, standard deviations, and coefficient alphas of four resulting scales were calculated. One way analysis of variance was employed to compare the scores of groups of students, again based on their field, grades, sex, ethnicity, and age. A short-term prediction study was conducted in which the incidence of graduate school accomplishments was correlated with these four scales, undergraduate

Table 1

Description of the Sample

Characteristic	N	Percentage of Sample
Sex		
Male	168	55
Female	140	45
Ethnic Identification		
American Indian or Native American	2	<1
Black, Afro-American or Negro	29	9
Mexican-American or Chicano	2	<1
Oriental or Asian-American	9	3
Puerto Rican or Spanish-speaking American	2	<1
White or Caucasian	250	81
Other	14	5
Age		
21 or less	18	6
22	80	26
23	61	20
24	46	15
25-29	63	21
30-34	27	9
35 or greater	10	3
Years Since BA		
0-1	138	46
2	45	15
3	41	14
4	22	7
5-9	37	12
10 or more	20	6
Position desired on completion of graduate school		
Postdoctoral fellowship	21	7
Teaching or administration in elementary or secondary school	2	1
Teaching in junior college	6	2
Teaching in a four-year college or university	52	17
University research and teaching	105	34
College or university administration	3	1
Research in industry or with non-profit organization or institute	40	13
Self-employed professional pract practice	4	1
Professional practice with a clinic, hospital, or agency	41	13
Executive position (administrator, curator, etc.) in a nonacademic organization including government	16	5
Other	18	6
Hours a week spent working during your last two years of undergraduate college.		
Did not work	80	26
1-10 hours	78	25
11-20 hours	92	30
21 or more hours	56	18

(continued)

Table 1 (continued)

Characteristic	N	Percentage of Sample
Undergraduate Major		
Biology	64	21
English	63	21
Psychology	96	31
Zoology	27	9
Other	57	18
Citizenship		
United States	291	94
Other	17	6
Previous Graduate Attendance		
None	233	76
Less than a year	16	5
More than a year	11	4
Obtained Master's degree	47	15
Graduate degree objective		
Non degree study	0	0
Master's (M.A., M.S., M.Ed., etc.)	58	19
Intermediate (such as Specialist)	1	<1
Doctorate (Ph.D., Ed.D., etc.)	207	67
Postdoctoral study	41	13
Work experience between graduation from college and entrance to graduate school.		
None	58	19
Part-time for less than six months	50	16
Part-time up to a year	8	3
Full-time for less than six months	76	25
Full-time up to a year	28	9
Full- or part-time for more than a year	86	28

grades, and the single pre-graduate school accomplishment that was most similar to, or most strongly related to, the graduate school accomplishment (e.g., writing a scientific article before graduate school was correlated with writing an article in graduate school). Items in the follow-up questionnaire that referred to students' sense of progress toward the attainment of certain skills were also correlated with the same variables.

Since students provided free response answers to questions about their most significant attainments and their reactions to the inventory, a qualitative analysis of the content of these responses was made. These analyses attempted to develop categories that would most effectively summarize these materials. The relative frequency of responses falling into the categories were noted, and subthemes and underlying reasoning also recorded. Examples of the responses were recorded and are frequently quoted in the following pages.

Analysis of Inventory: Structured Self-Reports of Accomplishments

Total sample. As shown in Table 2, the frequency with which students reported accomplishments varied widely among the accomplishments. For example, no students said they had entered an architectural contest (item #28), and only one percent said they had obtained a patent or patent disclosure (#13) or built musical instruments (#39). In contrast, 76 percent said they had held a job that taught them an important skill (#45), 65 percent said they had been an active member of a group that required close interaction with other people (#41), and 62 percent said they had served as a research or laboratory assistant (#58). In addition, at least half of the students said they had written a poem (#2), participated in athletics (#53), and served as a tutor (#59).

Students reported a surprising amount of writing activity, although, as we shall see later, very little of it was published. As expected, books (#'s 7 and 8), musical compositions (#10), and taking photographs for publication or for contests were fairly rare (#'s 14 and 26), as were the building or design of scientific apparatus (#17), and original solutions to mathematical problems (#18). However, the accomplishments of repeating scientific procedures (#19), conducting original scientific experiments (#20), and collecting scientific specimens (#21) were fairly common, with over a third of the sample reporting each.

Table 2

Percentage of Sample Reporting Each Accomplishment: By Field and College Grades

	Total Sample	By Field			By College GPA		
		Biology	English	Psychology	A	A-	B+ or below
(N)	(308)	(118)	(73)	(116)	(89)	(135)	(83)
1. Write a short story	41	33	53	41	40	40	41
2. Write a poem	50	35	75	49	56	47	48
3. Write a play	7	4	14	6	10	6	6
4. Write a "literary" article or essay	42	35	77	27	46	40	40
5. Write a scientific article	47	69	3	54	43	53	43
6. Write a "general" article (e.g., newspaper report, editoral, pamphlet).	30	28	37	28	29	30	31
7. Write a book dealing with some aspect of the sciences or social sciences	2	2	0	4	0	2	5
8. Write a "literary" book (e.g., novel, book dealing with social issues)	4	2	7	5	1	6	5
9. Author or coauthor an article presented at a professional meeting or conference	16	18	3	22	13	16	16
10. Compose a symphony, concerto, or sonata	2	2	3	3	3	2	1
11. Compose a "popular" song or "show" tune	7	6	10	6	12	5	4
12. Draw cartoons or illustrations	14	21	8	11	12	11	22
13. Obtain a patent or patent disclosure	1	0	0	2	0	0	2
14. Take photographs for a newspaper or magazine	5	3	5	7	6	7	2
15. Work as editor of a publication	11	4	29	8	15	10	10
16. Build a scientific apparatus or device (e.g., microscope, spectroscope)	11	16	1	13	10	11	13
17 Design or invent a piece of machinery, scientific apparatus, or electronic equipment	9	14	1	9	7	11	8

(continued)

Table 2 (cont.)

		By Field			By College GPA		
	Total Sample	Biology	English	Psychology	A	A-	B+ or below
18. Work out original solutions to mathematical problems (e.g., proofs for theorems or propositions not given by the instructor or textbook).	8	9	7	9	8	7	12
19. Repeat a known scientific procedure or demonstration (e.g., identification of elements or biological specimens).	41	65	5	38	35	44	41
20. Conduct an original scientific experiment.	43	56	3	56	40	47	40
21. Collect scientific specimens (e.g., fossils, rocks, microscopic slides, photographs of star movements).	33	69	5	13	21	40	33
22. Give a public musical performance.	25	24	32	22	26	26	20
23. Arrange or compose music (e.g., folk songs).	11	8	16	10	15	10	8
24. Enter a literary contest.	14	5	40	6	15	16	8
25. Produce original writing (e.g., fiction, nonfiction, poems, plays).	39	31	62	34	40	36	42
26. Enter a photography exhibit or contest.	5	6	4	5	7	6	2
27. Publicly display your drawings; cartoons, paintings, sculptures, or other fine arts work.	9	7	7	12	8	5	16
28. Enter an architectural contest or exhibition with original designs, building structures, or floor plans.	0	0	0	0	0	0	0
29. Publicly display objects that you designed and made.	4	4	4	4	4	4	4
30. Enter a public speaking or debating contest.	5	4	7	3	4	3	7

(continued)

Table 2 (cont.)

		By Field			By College GPA		
	Total Sample	Biology	English	Psychology	A	A-	B+ or below
31. Publicly perform or choreograph artistic dancing (e.g., ballet, modern dance, foreign dance).	6	6	4	6	7	5	5
32. Act in a play or movie.	14	12	19	14	15	15	13
33. Direct a play, movie, modern dance, or ballet.	6	5	7	7	7	6	6
34. Deliver a speech.	36	38	33	37	34	36	39
35. Make your own works of art (e.g., paintings, sculpture).	25	26	22	26	25	21	31
36. Make your own handicrafts items (e.g., jewelry, needlework, weaving, leather goods).	35	39	33	32	36	33	37
37. Design objects for use by others (e.g., program covers, stage settings, furniture).	13	14	14	12	12	10	18
38. Take photographs, movies, or slides.	49	66	29	43	39	55	48
39. Build musical instruments.	1	1	1	2	0	2	1
40. Build electronic equipment from your own design (e.g., radio, spectroscope).	4	5	1	5	7	4	2
41. Build mechanical devices from your own design (e.g., hydraulic pump).	4	5	0	4	1	4	5
42. Design buildings, boats, toys, equipment, or automobiles.	7	10	5	6	4	7	11
43. Design and construct clothing.	16	19	12	16	19	16	14
44. Design interiors of rooms and buildings.	7	6	3	12	4	7	11
45. Have you held a job that taught you an important skill?	76	77	68	80	74	76	77

Table 2 (cont.)

		By Field			By College GPA		
	Total Sample	Biology	English	Psychology	A	A-	B+ or below
46. Have you received a job promotion for outstanding performance?	31	30	23	39	36	27	34
47. Have you had major responsibility for another person (e.g., custodial care, emergency squad, parenting)?	37	31	32	45	30	32	51
48. Have you held a position in a group that tried to influence social institutions?	23	16	21	31	20	25	22
49. Have you been an active member of a group in which you had to interact closely with other people (e.g., youth counseling, camp counseling, church activities, community organizations)?	64	63	53	72	62	64	67
50. Have you supervised a group of volunteers (e.g., in a political campaign, neighborhood program for children, church organizations)?	25	21	16	34	26	26	23
51. Have you raised or managed money for an organization or project (e.g., community fund drive, served as treasurer of a club)?	29	30	22	33	36	25	29
52. Have you won an athletic award?	18	22	10	20	17	17	20
53. Have you participated in athletics (e.g., coached, managed, or played on a team or in a tournament)?	52	62	34	53	48	48	61
54. Have you been elected to a major class office (e.g., president, vice president, treasurer)?	12	13	7	16	7	12	19

Table 2 (cont.)

		By Field			By College GPA		
	Total Sample	Biology	English	Psychology	A	A-	B+ or below
55. Have you been appointed or elected a member of a college-wide student group, such as student council or student senate?	14	13	10	19	18	13	12
56. Have you been an elected officer in a community social group?	11	8	8	14	16	8	10
57. Have you served on a student-faculty committee?	19	16	23	18	21	19	16
58. Have you served as a research or laboratory assistant either in college or outside of college?	62	73	25	73	57	66	58
59. Have you served as a tutor for someone?	56	57	52	58	58	57	53
60. Have you started your own business?	6	4	4	10	6	4	11
61. Have you actively participated in a college, community, or religious service organization or program (e.g., served as chairman of a charity drive)?	23	21	16	30	31	21	19
62. Have you participated in any activities in the arts, humanities, or sciences that were not covered by this questionnaire?	24	30	27	16	27	22	24

Relatively few students had entered contests of any sort (#'s 24, 26, 28, and 30), or publicly displayed their artistic work or talent (#'s 29, 31, 33), with the exceptions of musical performances (#22) and speeches (#34). Fairly large numbers of students have made their own works of art (#35, 25%), handicrafts (#36, 35%), or photographs (#38, 49%). Again, the design or construction of any sort of object or equipment was relatively uncommon (#'s 37, 38, 40, 43, 42, 44).

Work experiences were fairly common (#47, 76%), as was participation in group activities (#'s 48, 49, 50, and 51). However, the holding of an office or position in an organization (#'s 51, 55, 56, and 57) was relatively uncommon.

Field differences. The comparative frequency with which students in biology, English, and psychology reported accomplishments related to the emphases of the fields. Thus, activities related to writing were generally most common among the English students, activities related to science most common among biology students, and activities involving interpersonal relations most common among psychology majors. Artistic activities were reported to the same extent in all three fields. There were also some intriguing results. For example, the biology students reported that they drew cartoons or illustrations more than other students, possibly because they may be required to make diagrams and illustrations in laboratory courses, and English students participated in athletics less frequently than other students. In general, these overall trends provide some evidence that the survey items are logically related to field differences and reflect real differences among students.

Differences related to college grades. The sample was divided into three groups according to their self-reported average undergraduate grades: A, A-, and B+ and below. As shown in Table 2, there were only small differences among the groups on most items. However, students in the "A" group more frequently reported that they had composed popular songs (#11), entered photographic contests (#26), built electronic equipment (#40), and participated in service organizations ("61). The "B+ and below" group more frequently reported that they had written books(#'s7, 8), drew cartoons or illustrations (#12), displayed their drawings or fine arts work (#27), built mechnical devices (#41), designed interiors (#44), held major responsibility for other persons (#47), participated in athletics (#53), and had been elected to major class offices

(#54). On balance, however, the overall level of accomplishment seemed to have little relationship to grades. This result is consistent with a large body of other research (Baird, forthcoming) and suggests that the inventory is assessing something different from purely academic achievement and, consequently may be providing siginificant information about applicants to graduate school.

Sex differences. Table 3 shows the frequency with which men and women students reported accomplishments. There were few differences. However, men more frequently reported experiences related to science: writing scientific articles (#5), building and designing scientific machinery (#'s 16, 17), repeating scientific procedures (#19), carrying out experiments (#20), collecting specimens (#21), and building electronic and mechanical devices (#40). Women more frequently reported experiences in expressive and organizational areas: writing literary essays (#4), working as editors of publications (#15), performing dances (#31), producing their own art (#35), creating their own handicrafts (#36), designing clothing (#43), participating in groups requiring close interaction (#49), raising money for groups (#51), and participating in service organizations (#61). Undoubtedly, a large share of these differences is attributable to the fields in which the men and women were studying. More men were in biology and more women were in English.

Ethnic differences. Based on their responses to an item asking students to indicate how they described themselves, students were grouped into three groups: Black, White, and Other. Blacks more frequently reported accomplishments involving leadership and organizational activities: participating in groups that require close interaction with others (#49), raising money for groups (#51), holding major class offices in college (#54), and being appointed or elected to positions in campus-wide groups (#55). Blacks also reported more frequent accomplishments in certain expressive areas: writing poems (#2), choreography (#31), and participating in athletics (#65). Blacks reported fewer accomplishments in scientific areas that required the ownership or access to expensive equipment. Whites more frequently reported that they had: written scientific articles (#5), taken photographs, movies or slides (#38), and built electronic equipment (#40). Whites less often held positions in groups attempting to influence social institutions (#48). The "Other" students more frequently reported that they had designed objects for use by others (#37). Despite these differences, the frequency of most accomplishments did not seem to be related to race, and each group reported more accomplishments of some type than the other groups.

Table 3

Percentage of Sample Reporting Each Accomplishment: By Sex, Race, and Age

		By Sex		By Race			By Age		
	Total Sample	Male	Female	Black	White	Other	22 or less	23-25	26 or over
(N)	(308)	(168)	(140)	(29)	(250)	(29)	(98)	(133)	(74)
1. Write a short story	41	42	40	45	41	34	40	38	49
2. Write a poem	50	49	51	62	49	45	49	47	55
3. Write a play	7	8	6	3	8	7	5	8	9
4. Write a "literary" article or essay	42	35	50	41	41	45	43	43	36
5. Write a scientific article	47	53	41	34	49	45	52	52	34
6. Write a "general" article, (e.g., newspaper report, editorial, pamphlet)	30	29	32	34	30	28	30	27	36
7. Write a book dealing with some aspect of the sciences or social sciences	2	4	1	0	2	3	0	2	7
8. Write a "literary" book (e.g., novel, book dealing with social issues)	4	4	4	7	4	3	3	3	8
9. Author or coauthor an article presented at a professional meeting or conference	16	18	12	21	15	17	12	16	20
10. Compose a symphony, concerto, or sonata	2	2	2	0	3	0	2	4	0
11. Compose a "popular" song or "show" tune	7	8	6	0	8	3	9	6	5
12. Draw cartoons or illustrations	14	13	16	10	14	17	18	13	12
13. Obtain a patent or patent disclosure	1	1	0	0	0	3	0	1	1
14. Take photographs for a newspaper or magazine	5	7	4	7	6	0	7	4	5
15. Work as editor of a publication	11	7	16	7	12	10	11	10	15
16. Build a scientific apparatus or device (e.g., microscope, spectroscope)	11	17	4	7	12	10	7	16	9
17. Design or invent a piece of machinery, scientific apparatus, or electronic equipment	9	13	5	0	10	10	7	11	9

(cont'd)

Table 3

		By Sex		By Race			By Age		
	Total Sample	Male	Female	Black	White	Other	22 or less	23-25	26 or over
18. Work out original solutions to mathematical problems (e.g., proofs for theorems or propositions not given by the instructor or textbook).	8	10	7	0	9	14	5	10	11
19. Repeat a known scientific procedure or demonstration (e.g., identification of elements or biological specimens).	41	46	34	24	42	41	48	44	26
20. Conduct an original scientific experiment	43	49	36	17	48	31	45	45	38
21. Collect scientific specimens (e.g., fossils, rocks, microscopic slides, photographs of star movements).	33	38	27	17	35	28	38	31	30
22. Give a public musical performance.	25	26	23	21	25	24	22	28	23
23. Arrange or compose music (e.g., folk songs.)	11	13	9	7	12	7	10	11	11
24. Enter a literary contest.	14	13	15	14	13	17	17	12	11
25. Produce original writing (e.g., fiction, nonfiction, poems, plays).	39	39	40	41	39	41	44	35	41
26. Enter a photography exhibit or contest.	5	7	4	7	5	3	6	4	7
27. Publicly display your drawings, cartoons, paintings, sculptures, or other fine arts work.	9	8	9	7	8	14	6	11	9
28. Enter an architectural contest or exhibition with original designs, building structures, or floor plans	0	0	0	0	0	0	0	0	0
29. Publicly display objects that you designed and made.	4	4	5	7	4	0	2	8	1
30. Enter a public speaking or debating contest.	5	5	4	10	4	7	6	3	5

(cont'd)

Table 3

	Total Sample	By Sex		By Race			By Age		
		Male	Female	Black	White	Other	22 or less	23-25	26 or over
31. Publicly perform or choreograph artistic dancing (e.g., ballet, modern dance, foreign dance).	6	2	10	21	4	3	6	6	4
32. Act in a play or movie.	14	14	15	17	15	7	14	15	14
33. Direct a play, movie, modern dance, or ballet.	6	4	9	7	6	7	7	5	8
34. Deliver a speech.	36	35	38	45	34	45	39	29	47
35. Make your own works or art (e.g., paintings, sculpture).	25	20	32	21	27	17	27	29	18
36. Make your own handicrafts items (e.g., jewelry, needlework, weaving, leather goods).	35	18	56	28	37	28	32	40	31
37. Design objects for use by others (e.g., program covers, stage settings, furniture)	13	13	13	3	12	28	12	15	11
38. Take photographs, movies, or slides.	49	51	46	34	51	41	49	47	51
39. Build musical instruments	1	2	1	0	1	3	0	3	0
40. Build electronic equipment from your own design (e.g., radio, spectroscope).	4	7	1	0	5	0	3	5	4
41. Build mechanical devices from your own design (e.g., hydraulic pump).	4	7	0	0	4	3	3	5	1
42. Design buildings, boats, toys, equipment, or automobiles.	7	9	6	0	8	7	4	10	8
43. Design and construct clothing.	16	4	31	24	16	10	16	16	16
44. Design interiors of rooms and buildings.	7	6	9	10	7	10	8	6	9
45. Have you held a job that taught you an important skill?	76	75	77	76	77	66	67	81	80

(cont'd)

Table 3

		By Sex		By Race			By Age		
	Total Sample	Male	Female	Black	White	Other	22 or less	23-25	26 or over
46. Have you received a job promotion for outstanding performance?	31	30	33	24	32	31	19	35	42
47. Have you had major responsibility for another person (e.g., custodial care, emergency squad, parenting)?	37	36	38	45	35	45	27	37	50
48. Have you held a position in a group that tried to influence social institutions?	23	26	19	34	20	34	15	27	23
49. Have you been an active member of a group in which you had to interact closely with other people (e.g., youth counseling, camp counseling, church activities, community organizations)?	64	54	76	86	63	52	66	64	62
50. Have you supervised a group of volunteers (e.g., in a political campaign, neighborhood program for children, church organizations)?	25	25	24	24	24	28	21	25	30
51. Have you raised or managed money for an organization or project (e.g., community fund drive, served as treasurer of a club)?	29	24	36	55	27	21	30	25	35
52. Have you won an athletic award?	18	22	14	21	18	21	19	18	18
53. Have you participated in athletics (e.g., coached, managed, or played on a team or in a tournament)?	52	54	49	65	52	38	50	56	49
54. Have you been elected to a major class office (e.g., president, vice president, treasurer)?	12	9	16	48	8	14	13	8	20

(cont'd)

Table 3

	Total Sample	By Sex Male	Female	By Race Black	White	Other	By Age 22 or less	23-25	26 or over
55. Have you been appointed or elected a member of a college-wide student group, such as student council or student senate?	14	14	15	24	14	10	17	14	12
56. Have you been an elected officer in a community social group?	11	10	11	24	10	3	9	10	14
57. Have you served on a student-faculty committee?	19	20	17	24	18	21	21	21	11
58. Have you served as a research or laboratory assistant either in college or outside of college?	62	63	59	55	63	52	57	64	64
59. Have you served as a tutor for someone?	56	51	62	69	56	48	59	53	58
60. Have you started your own business?	6	9	4	10	6	3	4	4	15
61. Have you actively participated in a college, community, or religious service organization or program (e.g., served as chairman of a charity drive)?	13	18	30	24	24	21	24	23	23
62. Have you participated in any activities in the arts, humanities, or sciences that were not covered by this questionnaire?	24	21	28	17	25	24	28	24	20

Age differences. One of the chief goals of this project was to find ways to provide systematic information about the accomplishments of older students, most of whom have been out of college for several years. The median age of students in the sample was 23.5 and the range was from 18 to 45 years. To study the influence of age on the frequency of experiences and accomplishments the sample was divided into three groups: those who were 22 or younger, those who were between the ages of 23 and 25, and those who were 26 and older. (The median age of students in this last group was 30 years.) The results, shown in Table 3, indicate that there were few differences among these groups. The only noteworthy exceptions were that older students less frequently reported that they had written a scientific article (#5), or repeated a scientific procedure (#19), and that older students more frequently reported that they had held a job that taught them an important skill (#45), received a job promotion (#46), held major responsibility for another person (#47), and had started their own businesses (#60). Of course, older students more often had made their accomplishments after college. Thus, on balance, older students appeared very similar to younger students in their accomplishments.

Responses to Detailed Questions about Accomplishments

The students who reported an accomplishment were asked detailed questions about the accomplishments. Their responses are summarized in Tables 4, 5, and 6. The percentages are based only on the responses of students who reported the accomplishment. For example, the figures in the first line of Table 4 are based only on the 126 students who indicated they had written a short story. Table 4 deals with accomplishments that resulted in some product or activity that could be published or circulated. Table 5 deals with accomplishments that could result in payment or which could be entered in a contest. Table 6 deals with accomplishments that result in some product which could be sold.

Table 4 shows (1) when the accomplishment took place, (2) whether it was part of a college assignment, (3) the extent to which it was circulated, (4) the percentage of students who named a specific publisher or publication, and (5) the median number of similar works. There was a wide range of responses to the questions. For example, 89 percent of those who wrote a literary essay did so during college, but only 29 percent of those who wrote a book on the social sciences did so during college, and there were no students who composed classical music after college. 79 percent of those who

Table 4. Answers to Detailed Questions about Accomplishments: Publication Activities

This percentage:	Did it				Circulated it this widely:					
Of those who:	During college	After college	Both	Did it as part of a college assignment	Never published	Local community, school, or college	Several communities, schools, or colleges	Nationally	Named a specific publication or publisher	And had an average of similar works of:
Wrote a short story.	87	5	9	60	85	10	2	1	8	3.0
Wrote a poem.	69	9	22	23	76	13	2	6	18	8.0
Wrote a play.	81	18	0	64	68	18	5	5	9	.5
Wrote a "literary" article or essay	89	9	2	79	72	15	3	5	18	4.0
Wrote a scientific article.	75	18	6	54	54	11	5	25	38	.6
Wrote a "general" article, (e.g., newspaper report, editorial, pamphlet).	79	19	2	29	24	56	11	5	49	3.0
Wrote a book dealing with some aspect of of the sciences or social sciences.	29	71	0	29	43	0	0	57	71	0
Wrote a "literary" book, (e.g., novel, book dealing with social issues).	38	30	23	15	100	0	0	0	0	0
Authored or coauthored an article presented at a professional meeting or conference.	54	40	4	17	25	0	13	46	83	.5
Composed a symphony, concerto, or sonata.	86	0	14	57	71	14	14	0	0	2.1
Composed a "popular" song or "show" tune.	62	14	19	5	71	10	10	5	14	6.1
Drew cartoons or illustrations.	64	23	14	11	68	14	2	11	20	5.0
Obtained a patent or patent disclosure.[a]										
Took photographs for a newspaper or magazine.	75	19	2	0	13	69	6	13	56	9.0
Worked as editor of a publication.	69	29	3	8	53	14	14	11	83	1.0

[a] Only two students reported this accomplishment.

Table 5. Answers to Detailed Questions about Accomplishments: Payment or Contest Activities

This percentage:	Did it			Did it as part of a college assignment	Did it			Received payment for it	Entered it in a contest at this level				And won this prize				Named a sponsor or contest	Had an average of similar achievements of:
Of those who:	During college	After college	Both		Alone	In a group	Both		Local community or college	Large city or region of state	Statewide	National or international	None	Honorable mention or equivalent	Prize other than first prize	First prize		
Built a scientific apparatus or device (e.g., microscope, spectroscope).	74	26	0	37	77	23	0	23	23	0	0	0	34	0	3	0	11	1.0
Designed or invented a piece of machinery, scientific apparatus, or electronic equipment.	71	29	0	36	67	32	0	29	7	0	0	0	21	0	0	0	0	1.5
Worked out original solutions to mathematical problems (e.g., proofs for theorems or propositions not given by the instructor or textbook).	88	12	0	58	85	15	0	4	8	4	0	0	38	0	0	0	4	1.5
Repeated a known scientific procedure or demonstration (e.g., identification of elements or biological specimens).	84	8	8	63	58	35	5	21	14	1	1	2	30	1	0	0	10	2.0
Conducted an original scientific experiment.	80	14	4	53	60	37	3	17	15	2	2	3	31	0	2	1	15	1.5
Collected scientific specimens (e.g., fossils, rocks, microscopic slides, photographs of star movements).	71	18	10	39	59	31	6	21	7	3	0	5	26	1	0	0	9	2.0
Gave a public musical performance	80	9	11	18	22	71	7	17	33	12	4	4	49	0	0	3	22	3.2
Arranged or composed music (e.g., folk songs).	58	21	21	9	76	15	9	3	18	9	0	3	30	0	0	0	12	3.5

Table 5 (cont.)

This percentage: Of those who:	Did it			Did it as part of a college assignment	Did it			Received payment for it	Entered it in a contest at this level				And won this prize				Named a sponsor or contest	Had an average of similar achievements of:
	During college	After college	Both		Alone	In a group	Both		Local community or college	Large city or region of state	Statewide	National or international	None	Honorable mention or equivalent	Prize other than first prize	First prize		
Entered a literary contest.	86	10	5	5	100	0	0	31	45	5	5	38	52	5	12	26	83	.5
Produced original writing (e.g., fiction, nonfiction, poems, plays).	63	17	19	26	92	5	2	8	19	3	2	8	36	2	1	3	18	3.2
Entered a photography exhibit or contest.	56	38	6	13	87	13	0	19	38	19	13	19	69	6	0	19	75	1.2
Publicly displayed your drawings, cartoons, paintings, sculptures, or other fine arts work.	81	19	0	33	67	33	0	7	59	7	0	11	48	4	0	7	44	.5
Entered an architectural contest or exhibition with original designs, building structures, or floor plans.[a]																		
Publicly displayed objects that you designed and made.	62	38	0	23	46	54	0	31	62	0	8	15	62	0	0	0	69	1.4
Entered a public speaking or debating contest.	100	0	0	29	57	29	0	7	43	14	14	7	43	7	14	14	64	.3
Publicly performed or choreographed artistic dancing (e.g., ballet, modern dance, foreign dance).	88	12	0	12	23	65	12	12	71	0	0	18	59	6	0	0	59	2.0
Acted in a play or movie.	82	12	5	18	2	91	0	11	35	16	0	7	32	5	0	2	18	1.2
Directed a play, movie, modern dance, or ballet.	74	21	0	16	42	58	0	5	42	5	0	0	26	0	0	5	21	1.2
Delivered a speech.	71	21	7	39	82	11	3	11	36	3	4	2	40	1	1	1	24	1.8

[a] No students did this.

Table 6. Answers to Detailed Questions about Accomplishments: Activities that Resulted in Products that Could be Sold

This percentage:	Did it					Drew customers from this area					
Of those who:	During college	After college	Both	Did it as part of a college assignment	Has sold these products	Local community or college	Large city or region of state	Statewide	National or international	Mentioned a type of product	And sold similar items an average of this many times[a]
Made your own works of art (e.g., paintings, sculpture).	64	14	22	14	15	10	8	0	1	42	2.0
Made your own handicrafts items (e.g., jewelry, needlework, weaving, leather goods).	58	21	20	3	16	15	1	1	0	35	6.0
Designed objects for use by others (e.g., program covers, stage settings, furniture).	70	23	5	13	18	18	0	0	5	35	1.2
Took photographs, movies, or slides.	49	28	23	5	9	7	2	0	3	22	2.5
Built musical instruments.[b]											
Built electronic equipment from your own design (e.g., radio, spectroscope).	62	15	15	31	0	0	0	0	0	30	0
Built mechanical devices from your own design (e.g., hydraulic pump).	64	18	18	0	0	0	0	0	0	18	0
Designed buildings, boats, toys, equipment, or automobiles.	48	39	13	4	4	9	0	0	0	26	1.0
Designed and constructed clothing.	52	24	24	4	18	8	4	0	6	30	0
Designed interiors of rooms and buildings.	48	22	22	4	0	0	0	0	0	0	0

[a] See text for explanation.

[b] Only four students did this.

had written a literary article or essay had done so as part of a college assignment, in contrast to 0 percent of those who took photographs for a newspaper or magazine. None of the students who had written "literary" books had published them. In contrast, 47 percent of those who had written social science books had published them on a national scale. Finally, the average number of similar works produced varied from 0 to 9. Overall, however, it appears that most writing activity is done during college, and that most of it is never published. Most of it was done independently, that is, it was not part of a college assignment (for the "average" activity only 31 percent said it was an assignment). This last result suggests that the inventory does pick up accomplishments that would not be part of transcripts that, by their nature, do not give details about activities, and activities which might escape the attention of faculty members who write letters of recommendations.

Table 5 shows (1) when the accomplishment took place, (2) whether it was part of a college assignment, (3) whether it was done alone or in a group, (4) whether the student received payment for it, (5) the level of any contests in which it may have been entered, (6) the prize won, (7) whether the student named a specific sponsor or contest, and (8) the median number of similar achievements. Again, there was a wide range in the percentages. Perhaps the most interesting results are the variations in the extent to which the accomplishments led to payment, ranging from 31 percent among those who displayed objects they had made and (31 percent among those who had entered a literary contest) to 3 percent among those who had arranged or composed music (and 5 percent among those who had directed a play). The variation in the percentage who had entered a contest was also striking, ranging from the 93 percent among those who had entered a literary contest to the 7 percent of those who had designed or invented machinery or scientific equipment. Overall, most of these "contest" accomplishments were done during the college years, not as college assignments, were done alone (with the obvious exception of accomplishments in the performing arts), did not receive payment, were entered in a local contest (if at all), and, with the exception of literary contests, did not receive a prize.

Table 6, which deals with accomplishments that might result in products that could be sold, shows results that have the same pattern as Tables 4 and 5. Although students had engaged in some activities after college, most reported activities from the college years. Few students had engaged in an activity as part of a college assignment, and few had sold a product. Thus, the question about the area from which customers were drawn is largely irrelevant.

Finally, the figures on the number of similar items sold are somewhat misleading, since so few students bothered to respond to this question that the figures are based on very few cases. Thus, the questions about sales and customers may be of questionable relevance to assessing the importance of an accomplishment.

Construction of Scales of Accomplishments

To explore the possibility that continuous involvement in an area is more meaningful than single accomplishments, an attempt was made to develop scales of accomplishments. As a first step, the total intercorrelation matrix of accomplishments was examined to determine the existence of clusters of related accomplishments. It became clear that there were four main clusters: a literary and expressive activity cluster, a science and technical activity cluster, an artistic cluster, and a social service-organizational activity cluster. After performing several iterations to improve the distribution, reliability, and content consistency of each scale, the items in the four scales shown in Tables 7 through 10 were chosen. The size of the item-scale correlations appears comparable to coefficients in similar analyses, and the low values are probably due to the infrequency of some accomplishments. The distribution of the scales are shown in Tables C-1 through C-4 in Appendix C. The distribution of scores on these scales is somewhat skewed, but Richards and Holland (1967) showed that skewness in these types of scales does not seem to alter their usefulness.

The tables also show the mean scale scores, the median scale scores, the standard deviations, and the coefficient alphas. The coefficient alphas seem adequate for the purposes of the project. The means and standard deviations on the scales for various groupings of students are shown in Table 11. The F values for simple one-way analyses of variances across the groups are provided below the means for each grouping. These results are consistent with the results for individual items reported in the last section. Thus, English majors scored highest on the literary expressive scale, biology majors scored highest on the scientific-technical scale, and psychology majors scored highest on the social service-organizational activity scale. Unexpectedly, biology students scored highest on the artistic scale. Additional analyses of the properties of the scales within fields were also conducted. These analyses showed that the scales' properties within fields were very similar to those in the entire sample. The only exception was that the scientific-technical scale was not very reliable in English, probably because of the very low mean in that field and the very small variance. There were no significant differences among the groups of students with different

Table 7

Items Comprising the Literary-Expressive Cluster

Item	Correlation with Scale Score
Write a short story.	.68
Write a poem.	.72
Write a play.	.44
Write a "literary" article or essay.	.58
Write a "literary" book (e.g., novel, book dealing with social issues).	.30
Work as editor of a publication.	.43
Enter a literary contest.	.54
Produce original writing (e.g., fiction, nonfiction, poems, plays).	.69
Act in a play or movie.	.47
Direct a play, movie, modern dance, or ballet.	.34

Scale Mean 2.28 Scale Standard Deviation 2.05

Scale Median 1.97 Scale Coefficient Alpha .80

Table 8

Items Comprising the Artistic Cluster

Item	Correlation with Scale Score
Draw cartoons or illustrations.	.53
Enter a photography exhibit or contest.	.31
Publicly display your drawings, cartoons, paintings, sculptures, or other fine arts work.	.44
Make your own works of art (e.g., paintings, sculpture).	.66
Make your own handicrafts items (e.g., jewelry, needlework, weaving, leather goods).	.69
Design objects for use by others (e.g., program covers, stage settings, furniture).	.47
Take photographs, movies, or slides.	.63
Design and construct clothing.	.50
Design interiors of rooms and buildings.	.46

Scale Mean 1.74 Scale Standard Deviation 1.78

Scale Median 1.28 Scale Coefficient Alpha .68

Table 9

Items Comprising the Scientific-Technical Cluster

	Correlation with Scale Score
Write a scientific article.	.69
Author or coauthor an article presented at a professional meeting or conference	.37
Build a scientific apparatus or device (e.g., microscope, spectroscope).	.53
Design or invent a piece of machinery, scientific apparatus, or electronic equipment.	.53
Repeat a known scientific procedure or demonstration (e.g., identification of elements or biological specimens).	.70
Conduct an original scientific experiment.	.69
Collect scientific specimens (e.g., fossils, rocks, microscopic slides, photographs of star movements).	.59
Build electronic equipment from your own design (e.g., radio, spectroscope).	.31
Build mechanical devices from your own design (e.g., hydraulic pump).	.36
Design buildings, boats, toys, equipment, or automobiles.	.27
Have you served as a research or laboratory assistant either in college or outside of college?	.54

Scale Mean 2.77	Scale Standard Deviation 2.23
Scale Median 2.53	Scale Coefficient Alpha .73

Table 10

Items Comprising the Social Service-Organizational Activity Cluster

	Correlation with Scale Score
Have you had major responsibility for another person (e.g., custodial care, emergency squad, parenting)?	.48
Have you held a position in a group that tried to influence social institutions?	.43
Have you been an active member of a group in which you had to interact closely with other people (e.g., youth counseling, church activities, community organizations)?	.64
Have you supervised a group of volunteers (e.g., in a political campaign, neighborhood program for children, church organizations)?	.53
Have you raised or managed money for an organization or project (e.g., community fund drive, served as treasurer of a club)?	.56
Have you been elected to a major class office (e.g., president, vice president, treasurer)?	.34
Have you been appointed or elected a member of a college-wide student group, such as student council or student senate?	.42
Have you been an elected officer in a community social group?	.49
Have you served on a student-faculty committee?	.44
Have you actively participated in a college, community, or religious service organization or program (e.g., served as chairman of a charity drive)?	.56

Scale Mean 2.57
Scale Median 2.33

Scale Standard Deviation 2.01
Scale Coefficient Alpha .65

Table 11

Mean Scores of Groupings of Students on Accomplishment Scales

	Scale[a]			
	LE	A	ST	SS
1. By Field				
English	3.84	1.29	.48	2.03
Biology	1.91	2.28	3.98	2.48
Psychology	1.81	1.45	2.85	3.06
F	24.55**	6.56**	63.81**	5.02*
2. By Undergraduate GPA				
A	2.19	1.63	2.39	2.67
A-	2.23	1.65	3.03	2.44
B+ and Below	2.19	2.00	2.70	2.67
F	.40	1.22	2.25	.52
3. By Sex				
Male	2.13	1.38	3.19	2.35
Female	2.46	2.17	2.26	2.82
F	2.02	15.78**	13.97**	4.21*
4. By Racial Group				
Black	2.44	1.45	1.76	3.89
White	2.28	1.78	2.92	2.42
Other	2.17	1.69	2.45	2.48
F	.14	.46	3.93*	7.30**
5. By Age				
22 and Below	2.34	1.74	2.76	2.45
23-25	2.16	1.80	2.98	2.53
26 and Above	2.46	1.65	2.43	2.80
F	.55	.16	1.42	.66
All Students	2.29	1.74	2.78	2.57

[a] LE = Literary Expressive
ST = Scientific Technical
A = Artistic
SS = Social Service and Organizational Activity

*p<.05
**p<.01

grades. There were also no significant differences between men and women on the literary-expressive scale. Women did score significantly higher on the artistic and social service scales, and men scored higher on the scientific-technical scale. Groups of students of different ethnicity did not significantly differ on the literary expressive scale or the artistic scale. Whites had higher scientific-technical scores and blacks had higher social service and organizational activity scores. Finally, there were no significant differences among groups of students of different ages. The distributions of scores for each group was also calculated. The medians of each group, shown in Appendix D, are consistent with the results just described, but some of the differences between groups are even more pronounced.

Short-Term Prediction Study

Students were followed up at the end of their first year of graduate school and asked about their accomplishments during that year. The 23 accomplishments, which were adapted from Ward and Frederiksen's (1977) questionnaire, are shown in Table 12. Students were also asked for their overall first year graduate school grades. Together, these accomplishments and grades were designed to cover most significant attainments in the first year of graduate study. As in pre-graduate school attainments, the frequencies of graduate school accomplishments varied widely. Over a third of the sample had attended a scholarly or professional society meeting, subscribed to at least two scholarly or professional journals, prepared a detailed proposal or plan for a dissertation or thesis, or research project, carried out an independent research project, carried out a research project with someone else, or taught one or more sections of an introductory undergraduate course. In contrast, fewer than one in twelve had written a paper that was accepted by a journal, written a fiction piece, written an article for a popular magazine, directed or produced a dramatic production, assisted in editing a book, or designed or built a piece of laboratory equipment.

Table 13 shows the correlations of pregraduate school information with these accomplishments. Pregraduate predictors included the four accomplishment scales, undergraduate grades, and the best single-item predictor of the follow-up accomplishment. The best single-item predictor was the item most strongly related conceptually or the most similar item among the pregraduate accomplishments. Also shown are the correlations with graduate school grades. These analyses are based on the 142 cases in all fields for whom complete merged data was available.

Table 12

Frequency of First-Year Graduate School Accomplishments

Accomplishment	Percentage of Sample Reporting
Attended one or more meetings of a scholarly or professional society	54
Subscribed to two or more scholarly or professional journals	34
Been author or coauthor of a paper accepted for presentation at a meeting of a scholarly or professional society	14
Been author or coauthor of a paper submitted for publication to a scholarly or professional journal	18
Been author or coauthor of a paper accepted for publication by a scholarly or professional journal	6
Been author or coauthor of a fiction piece	8
Wrote an article for a popular magazine	1
Directed or produced an actual dramatic production	2
Prepared a detailed proposal or plan for a dissertation, master's thesis, or other major research project	36
Carried out an independent research project	56
Carried out a research project in collaboration with another student or a faculty member	43
Had teaching responsibility for one or more sections of an introductory undergraduate course	44
Had teaching responsibility for one or more sections of an advanced undergraduate course	23
Conducted a section of an undergraduate class on one or several occasions	30
Frequently advised or tutored other graduate students in your field	25
Assisted in editing of text or preparing of bibliographic material for a book	8
Programmed a computer to analyze research data	16
Prepared a course syllabus	17
Entered a literary or scientific context or competition	11
Won a literary or scientific contest or competition	3
Worked, interned, or did a practicum outside the environs of the campus	18
Designed and built a piece of laboratory equipment	8
Learned to operate or maintain a piece of electronic equipment	25

Table 13

Correlations of Graduate School Accomplishments with Pre-Graduate Study Information and Correlation with Graduate School Grades
(N=142)

	LE	A	ST	SS	SBI	UGPA	GGPA
Attended one or more meetings of a scholarly or professional society	.14*	.30**	.08	.12	.25**	.10	.00
Subscribed to two or more scholarly or professional journals	.13	.06	.22**	.11	.23**	.12	.02
Been author or coauthor of a paper accepted for presentation at a meeting of a scholarly or professional society	-.09	.10	.20**	.11	.36**	.01	.12
Been author or coauthor of a paper submitted for publication to a scholarly or professional journal	-.04	.09	.21**	.06	.25**	-.05	.13
Been author or coauthor of a paper accepted for publication by a scholarly or professional journal	-.03	.05	.17*	-.17*	.24**	.10	.09
Been author or coauthor of a fiction piece	.29**	-.01	-.15*	-.01	.35**	.14*	-.14*
Wrote an article for a popular magazine	.19**	.19**	.00	.09	.29**	.10	.00
Directed or produced an actual dramatic production	.26**	.09	-.05	.14*	.48**	-.01	-.03
Prepared a detailed proposal or plan for a dissertation, master's thesis, or other major research project	.08	.20**	.04	.19**	.24**	.08	-.04
Carried out an independent research project	.06	.08	.20**	.02	.25**	-.14*	.14*
Carried out a research project in collaboration with another student or a faculty member	-.08	-.03	.21**	.01	.31**	-.14*	.26**
Had teaching responsibility for one or more sections of an introductory undergraduate course	-.02	-.12	.17*	-.14*	.21**	-.02	.04
Had teaching responsibility for one or more sections of an advanced undergraduate course	.02	.14*	.14*	.14*	.24**	-.11	.08
Conducted a section of an undergraduate class on one or several occasions	.06	-.02	.12	.09	.22**	-.05	.00
Frequently advised or tutored other graduate students in your field	.08	.21**	.29**	.05	.32**	.07	.00

(continued)

Table 13 (continued)

	LE	A	ST	SS	SBI	UGPA	GGPA
Assisted in editing of text or preparing of bibliographic material for a book	.07	.18*	.13*	.11	.21**	.05	.01
Programmed a computer to analyze research data	.04	.18*	.21**	.09	.26**	.04	.10
Prepared a course syllabus	.07	-.07	-.03	.04	.16*	-.04	.03
Entered a literary or scientific contest or competition	.10	-.08	-.05	-.09	.27**	.06	.05
Won a literary or scientific contest or competition	.07	-.01	-.01	.12	.22**	-.11	.08
Worked, interned, or did a practicum outside the environs of the campus	.09	.06	-.01	.24**	.25**	.12	-.01
Designed and built a piece of laboratory equipment	.04	.12	.22**	.12	.26**	.02	-.05
Learned to operate or maintain a piece of electronic equipment	.04	.13*	.50**	.02	.48**	-.03	.05
First year graduate school GPA	-.01	.03	.03	.08		.30**	

Note: LE = Literary Expressive Scale
A = Artistic Scale
ST = Scientific Technical Scale
SS = Social Service and Organizational Activity Scale
SBI = Single Best Item Predictor
UGPA = Undergraduate Grade-Point Average
GGPA = Graduate School Grade-Point Average

*<.05
**<.01

Note: Correlations are biserial except for SBI which are tetrachoric.

Most of the graduate school accomplishments were correlated at a statistically significant level with one or more of the predictors. However, in general, the correlations are not high. With one exception, none of the correlations of the four accomplishment scales and undergraduate grades with the follow-up accomplishments exceeded .30.

In general, the accomplishment scales were related to the follow-up attainments in plausible ways, although there are some unexpected results. Thus, scientific attainments were predicted best by the scientific-technical scale, writing attainments by the literary-expressive scale, etc. However, it is unclear why the artistic scale was the best predictor of attendance at meetings of scholarly or professional societies, nor why only the artistic and social service scales were correlated with planning a dissertation or major research project.

Neither undergraduate nor graduate grades were related to the attainments with three interesting exceptions. Writing a fiction piece was positively related to undergraduate grades and negatively related to graduate grades. Possibly fiction writing was emphasized at the undergraduate level, but was seen as external to scholarly pursuits at the graduate level. Conversely, both carrying out an independent research project and carrying out a research project in collaboration with others were negatively related to undergraduate grades and positively related to graduate grades. Certainly research is emphasized at the graduate level, but it is unclear as to why it would be negatively related to undergraduate grades. Although it is difficult to know how these correlations are affected by the attenuation in the range of undergraduate grades, the overall lack of relationship between grades and graduate school attainments suggests the independence of these kinds of activities from sheer academic performance. It is worth noting that undergraduate grades were correlated .30 with graduate grades both of which were highly restricted in range in the sample.

The "single best item" in the predictors was included to test the possibility that the best predictor of a specific accomplishment would be a very similar earlier accomplishment, rather than a high number of related, but somewhat different accomplishments, as reflected in the scale scores. That is, are people who are likely to write a journal article, those who have already written one? Although there were not precise equivalents of every graduate school attainment in the inventory, there was a similar item in almost every case.

Overall, the results show that the most similar item correlated somewhat higher than the best scale score. The median difference in correlation was .05 and the mean difference was .067. Thus, knowledge about specific similar behaviors provided better prediction of specific graduate school attainments than did knowledge about an array of related accomplishments. However, it is likely that the scale scores would provide more stable and reliable information for general use in admissions, and that the scales might predict attainments later in the graduate school career more effectively than the items.

To examine the possibility that these correlations were inflated due to the differences among fields, within field analyses were also conducted. The results of these analyses are quite voluminous so they are not shown here. The correlations of the pre-graduate school accomplishments and scales with the graduate school accomplishments were compared. In 75 percent of the comparisons, the correlations within fields were higher than the correlations for the entire sample. Of the remaining 25 percent, the great majority of within field correlations were only slightly lower than the correlations based on the combined sample. The same lack of correlation between grades and graduate school accomplishments appeared in the within field results.

Students' Sense of Progress

Students indicated their sense of progress toward the attainment of skills and competencies on a four-point scale, as shown in Table 14. They could also indicate that they had no experience in the area or that it was not applicable. The ratings show that nearly all students felt that knowledge of the literature in their area, familiarity with bibliographic techniques, the ability to gain insight into materials in the field, the ability to design and evaluate research studies, and knowledge of theoretical approaches in the discipline were applicable to their experience. Students felt they had made most progress toward skills in conducting experiments with living things, ability to gain insight into the materials of the field, ability to use the scientific method, and, for those to whom it applied, the ability to gain insight into the problems of clients or patients. Students felt they had made the least progress toward a reading knowledge of foreign language, knowledge of mathematical or statistical techniques, familiarity with various modes of criticism, and knowledge of theoretical approaches to their discipline. However, not too much importance should be assigned to these differences. The mean of the item rated highest was close to "Above Average" whereas the mean of the item rated lowest was close to "Average." Obviously students felt they had made good but not excellent progress in every area.

The highest correlations between pre-graduate school accomplishments and students' ratings of their progress during the first year of graduate school ranged from .17 to .48 with a mean of .27. This

Table 14

Students' Sense of Progress toward Skills and Competencies

	Percentage NA[a]	Mean Rating[b]
Knowledge of literature in your area of specialization	0	2.50
Familiarity with bibliographic techniques in your area	2	2.26
Familiarity with various modes of criticism	7	2.62
Knowledge of mathematical and/or statistical techniques	15	2.77
Ability to gain insight into the problems of clients or patients	49	2.18
Ability to use scientific instruments and apparatus	19	2.30
Ability to use scientific method	11	2.18
Skill in conducting experiments with living things (e.g., plants, animals, human subjects)	21	2.10
Ability to gain insight into the materials of your field	2	2.12
Ability to design original research studies	4	2.30
Ability to evaluate research studies	4	2.42
Knowledge of theoretical approaches in your discipline	1	2.60
Ability to teach complex ideas to undergraduates	11	2.25
Ability to interpret research findings	6	2.39
Knowledge or understanding of historical context out of which literature evolves	9	2.53
Reading knowledge of foreign language	20	2.90

[a] Percentage that indicated they had no experience in this area or that the item did not apply to them.

[b] Mean rating given by students to whom the skill or competency was relevant on the following scale:

1. Exceptionally well prepared
2. Above average
3. Average
4. Below average

suggests that students who were more active and reported more pre-graduate school attainments relevant to each area of progress felt they had benefited more from their first year than did other students.

Semi-Structured Self-Reports

At the end of the inventory of pre-graduate accomplishments students were asked to describe three experiences that they considered highly significant in their preparation for graduate study, or that gave them the greatest sense of accomplishment. These may or may not have appeared in the preceding lists of accomplishments. Then, for each experience or accomplishment, students were asked to:

(1) briefly describe the experience, providing specific details about where and when it occurred, and how and why it was initiated;

(2) describe any skills, competencies, knowledge or special accomplishment they felt resulted from the experience;

(3) if possible, provide evidence of the quality or level of attainment this achievement represents;

(4) describe the relevance of the skills, competencies or knowledge resulting from the experience for the students' educational goals;

(5) give the names and locations of individuals that are acquainted with their work in the area of the experience.

Altogether, 82 percent answered these questions for at least one experience , 58 percent two, and 35 percent three. (A number of students later commented that they felt they had no accomplishments or at best one that warranted such detailed reporting). The resulting responses were quite varied in substance and style. They ranged from reports of purely academic attainments (e.g., being elected to Phi Beta Kappa) to the most personal feelings (e.g., "I fell in love"). They covered experiences of the most general kind ("My whole undergraduate education") to the most specific ("Took field courses in Freshwater Algae, Biology of the Ferns, Aquatic Entomology and Bryophytes at the University of Minnesota Biological Station in summer of 1977.") These responses were analyzed in order to find answers to specific questions:

—What is the nature of the experiences that students consider important?

—Are these experiences picked up in the earlier listings of accomplishments? If so, how adequately did the listings describe them?

—What is the character of the skills, knowledge, or special accomplishments claimed?

—What kind of evidence is provided for the quality or level of the achievement?

—In what ways do students believe their experiences prepared them for graduate school? What skills do students believe are needed in graduate school?

—What kind of documentation in terms of verifiable facts or references to knowledgeable individuals do the students provide?

The answers to these questions have clear implications for the revision of the inventory.

1. What is the nature of the experiences that students consider important?

As indicated earlier, the experiences described by students covered an extremely wide range. To provide the reader some sense of this diversity, the following, fairly typical examples are provided:

> During my senior year at University I was involved in a research project on how plants respond to wind. I was interested in some independent work but as I became more involved the more I wanted to work. Ultimately I was directly involved in three major branches of current research of the wind response of plants; hormone interactions, morphogenesis and ecological implications.

* * *

> I was part of a student research project sponsored by the National Science Foundation for the summer following my junior year. It took place in at the extension. My research project was a pilot-type validation of a questionnaire linking the self-concept and the body image.

* * *

Teaching at High School in I taught biology, genetics, physical science, and general science for two years after graduating college. Reason for teaching was to provide a means of self-support prior to entering graduate school.

Participating in the Program as an undergraduate. This program is an intensive clinical program allowing one contact and instruction by professionals, practicums for each area you studied such as indiv. therapy, group therapy, activity therapy, testing.

* * *

Participation in the College Drug Counselor Training Program in during my senior year of undergraduate study. I applied for admission into this program, because I felt a need to get involved in the "real life" side of my field of study. I wanted to do something useful and constructive. I wanted to apply all the theory I had learned.

* * *

Cooperative Educ. work experience
--was a peer counselor for Upward Mobility Program. Made career development plans for underemployed employees. Involved counseling, communicating with supervisors and educational institutes, researching Personnel references and compiling information. Assisted director of Program and director of Cooperative Education Program.

* * *

As part of a class dealing with cancer and children we volunteered at the university children's hospital. We were allowed to wander in and out of the patients' rooms depending on whether or not they wanted to talk to us. We took games from the recreation center and played with children (age 6-18) at their bedside, took them for short walks, etc.

* * *

Designed and Tested Inventory (DSI), a 330-question computerized questionnaire built with the aid of Dr. Dept. of Psychiatry during 1976-1978 to provide accurate national data on sexual attitude and behavior.

* * *

Experienced doing research under the guidance of a Biostatistician at for one summer. I had the experience of computer programming biological data on the effects of radiation on the ageing process.

Starting a high school. In summer, 1976, in three friends (incl. me) decided we wanted to teach and that the best way to do that was to start our own alternative school. We did the required leg work quickly. I participated as teacher and co-administrator for two years before beginning graduate school.

* * *

I prepared and presented a paper to the Interdisciplinary Honors Seminar during my senior year of college. Under the direction of a professor of English and a professor of French, I did independent study on the literary relationships between Madame de Stael and Margaret Fuller. Then I gave a one-hour, oral presentation of my findings to a group of fellow honors students and the faculty members of the Honors Committee. A copy of my paper was filed at the university library. Such a project is required for graduation with honors from University.

* * *

(Additional examples of accomplishments are provided in Appendix E.)

The great majority of accomplishments (over 90 percent) were in three main categories:

(a) Accomplishments related to employment,
(b) Academic experiences, and
(c) Interpersonal experiences.

Another "category" of idiosyncratic attainments and experiences--e.g., "build my own house," "was rejected by all the graduate schools to which I first applied"--comprises the remainder.

(a) Accomplishments related to employment. The majority of students (74 percent) had worked to some degree during their last two years of undergraduate study, 48 percent at least 11 hours a week, and 18 percent 21 or more hours. In addition, 81 percent had worked between the time they had graduated from college and the time they had entered graduate school. 61 percent had worked in some position full time, and 37 percent had worked full time for a year or more. Altogether, this represents a great deal of work experience. Many of the work experiences involved the acquisition of technical skills or knowledge (e.g., becoming familiar with the taxonomy of acquatic invertebrates, animal care of rhesus monkeys, library research skills, conducting intake interviews at a drug counseling program, administering personality tests, and management of computer typesetting system). Most of these involved skills that were directly relevant to the academic field the student entered, although some were so specific that one might question their generalizability for work in the field. In other cases, the employment experiences involved general traits that might be related to the field (e.g., in teaching in high school, learning to communicate with students and teach them divergent thinking; in serving as an assistant to investigative reporters, learning to edit and sift through sources of information; in working in a biological field station, learning to work independently; and in working in a laboratory, learning the importance of care and accuracy in research projects). Many of these work experiences involved interpersonal skills: organizing and managing others, working cooperatively toward a goal, dealing with clients, instructing others, interviewing, communicating, counseling, dealing with distraught people, delegating authority, and motivating others. These experiences that involve general characteristics and interpersonal skills seem as related to the general maturation of students as to their preparation for graduate school. That is, they seem good preparation for a wide variety of adult roles rather than being specific to graduate study.

(b) Accomplishments related to academic work. Many students mentioned experiences in classwork or ones related to their undergraduate experiences. Some commonly cited experiences were participation in research projects, the writing of a thesis, academic internships, experiments or studies conducted as part of a class, assistantships, and independent study. The details provided about these experiences indicated that the great majority of them would not appear on a transcript. The experiences typically involved specific skills, such as "course project in developmental anatomy, in which I designed an experiment, made slides, and interpreted the results;" "as a research assistant in psychopharmacology, learned rigorous experimental techniques;" and "edited college literature magazine and learned how to make decisions with others." However, many other experiences involved broad general skills, such as: "Led a small group in class on nonverbal communication; learned to communicate more effectively and to lead groups;" as an undergraduate lab assistant I had to learn to work in front of people, and also learned the subject better;" and "wrote an honors thesis on a minor poet and learned to write critical papers and to work independently."

Many students described an experience in a college group as significant for their development: "playing in musical groups in college gave me confidence in my ability to interact with large groups of people;" "held position in a college service organization with the goal of helping others. This taught me how to develop a budget, raise funds, and organize activities;" "president of a chapter of a national sorority, learning leadership skills, parlimentary procedure, and organizing skills;" and "lived in international house in college, served as social chairman; I learned to deal with different kinds of people, on an adult level, organizing and delegating authority." In general, students cited the skills they gained in interaction, communication, organization, and management.

Finally, a number of students described general aspects of their college experience as significant for their development and preparation for graduate school: "was Phi Beta Kappa, based on my study skills;" "going to a black college and having many role models;" "completion of M.A. thesis on perception of accents--learned to work independently and to use research skills;" "took independently designed courses in undergraduate school, learned to focus on questions, and how to do library and interview research;" and "took a broad liberal arts program as an undergraduate that provided me with a wide range of knowledge." (Chickering, 1969, has noted the importance of college experiences for students' personality development.)

(c) Interpersonal experiences. Many students described interpersonal experiences that had had a significant effect on their development. Some of these experiences were the result of employment and other adult roles: "teaching in a home for delinquent girls I learned to handle troubled children;" "raising two children led to patience and endurance;" "worked in public schools as an educational aid in the career education area, counseled youth concerning career opportunities, and learned to understand adolescents better," "in a practicum with geriatric patients I developed compassion for patients and learned to initiate activity in unmotivated individuals," "as a student advisory committee member on the California Post-Secondary Education Committee, I had a chance to meet many people concerned with current issues," "in working in politics at the city and county level, I learned community organization, public speaking, and improved writing ability."

Some also mentioned the importance of professors in inspiring and encouraging them to master their field and to continue their studies.

2. Did students report these experiences in the earlier listings of accomplishments? If so, how adequately did they describe them?

Over half of the significant accomplishments reported by students in the free response section were not reported in the earlier listings, or were reported in ways that made it difficult to judge their importance. For example, consider the item "write a literary article or essay," and a student's response that it was circulated in the local community or college in a publication titled "Lancers," and he or she had nine or more similar works. Now this may mean that the student reviewed movies for the college newspaper, or that he or she contributed a number of extensive articles reviewing current European literature to the college's literary magazine, some of which were used as texts in courses in the English department. Only the open ended questions could obtain this later information. As noted in the section describing the nature of students' accomplishments, many accomplishments in the academic area and the interpersonal area were not reported in the inventory. The work experiences of students seemed to have been reported, but only in the ways allowed by the item: "Have you held a job that taught you an important skill?," to which the student can reply yes or no, and if "yes" can write in the nature of the skill. Obviously the quality of the experience and the level of skill are difficult to judge from this information.

3. What is the character of the skills, knowledge, or special accomplishments listed?

In general, the skills and knowledge students list as resulting from their experiences match the areas of their accomplishment fairly well. (As the reader probably noticed, it was necessary to describe the character of the skills or knowledge in order to understand the significance or meaning of the accomplishment.) These included general skills pertinent to academic work, general interpersonal skills, specific academic skills, specific work related skills, general knowledge of the field, and influences on personal characteristics.

The general skills pertinent to academic work included gaining knowledge of research techniques, the importance of careful attention to detail, experimental design, writing clearly and precisely, organizing ideas, etc. Some examples: "I learned how to design and carry out large scale research projects and learned something of supervision." "I learned interviewing skills and how a research project works (or doesn t work?);" "I learned how to read quickly and how to be a first rate editor." "I learned how to think, how to approach questions, how to not be afraid of questioning;" "ability to teach a subject to neophytes."

General interpersonal skills included administrative skills, leadership, the ability to organize groups, communication skills, making decisions with others, etc. Some examples: "I gained skill and competence in communicating with others as well as understanding other people's communication patterns more fully;" "Administrative, managerial, political, communications skill and competencies were required to meet demands of various contingencies. I also organized operational systems for both aid and non-aid employment where none had existed before."

Specific academic skills included a wide variety of technical skills, such as running experiments in visual perception, preparing manuscripts for publication, learning the taxonomy of an animal group, and learning statistics and computer analysis.

Specific work-related skills ranged widely from learning business record keeping to obtaining counseling skills for working with people needing sexual information, and from learning courtroom procedure to applying technology to underdeveloped countries.

Gaining knowledge of the field was mentioned by a number of students who felt that their experience or accomplishment had given them a better foundation in their field or some aspect of it, such as cell biology or genetics in biology, British literature or linguistics in English, and developmental or physiological psychology.

Finally, a number of students felt that various experiences had affected their personal characteristics, especially in three areas: perserverance, patience or endurance; self-sufficiency, discipline or self-confidence; and interest in or enthusiasm for the field.

These five categories encompass almost all of the kinds of skills or knowledge listed by students, with the exception of students who listed personal satisfaction or enjoyment as the outcome of their experience.

It seems important to ask students to describe the skills they had developed through their experiences; although there were a few attainments that were self-explanatory, most required students' descriptions of what they thought they had learned, or the skills they felt they had developed, before they could be adequately interpreted.

4. What kind of evidence is provided for the quality of the achievement?

When students were asked to provide some evidence of the quality of their accomplishment, approximately 85 percent of those who listed accomplishments responded in some way. Given the personal or private nature of some attainments, this result might have been expected. Of those who did respond, the largest number mentioned the opinions of other people as evidence. Most often this person was a professor or instructor. The opinions or evaluations of students the respondent had taught were also frequently mentioned. In both cases, a name and address of the individual(s) was usually provided. The next largest category of evidence consisted of some official recognition of their achievement such as a license, being voted "outstanding teacher," being given a sorority chapter service award, etc. In the case of competitions, the prize was mentioned. In the case of academic achievement, the grade or honor society was mentioned. The name or nature of a publication (e.g., "international psychopharmacology journal") was mentioned in the case of publications. The last major category consisted of references to some impact on individuals, or specific actions taken (e.g., "program served over 40 mentally retarded children"). In general, it was easy to understand and interpret the evidence provided.

5. In what ways do students believe their experiences prepared them for graduate school?

The most common response to the question about the relevance of students' experiences or accomplishments to their graduate educational goal was to simply state that the experience was relevant to their studies, an answer that usually required a rereading of their answers to the skills question. Here is an example: "I am hopeful of going into research in the field of ecology and will be learning specific techniques in this area through my years in graduate school. The research project I pursued as an undergraduate was essential in providing the necessary background for further study." This students' answer to the "skills" question (#2) was "I learned the major techniques used in conducting ecological research on small mammals and became familiar with a great deal of scientific literature involved with this field." Some students simply referred to the skills question (e.g., "see #2 above").

The second most common response was to refer to general characteristics they had developed because of the accomplishment. The most common of these were confidence, motivation, and discipline. Interpersonal skills and interest in the field were also mentioned fairly often.

The remainder of the responses chiefly consisted of specific skills, such as operating specific technical equipment (e.g., autoclave), specific knowledge from the field, library skills, statistics, etc., that the students felt were directly related to their own personal educational goals. Thus, answers to the questions about the ways the achievements had helped prepare the student for graduate school overlapped so highly with questions about the skills they had developed that these two aspects should be combined in one question.

6. What kinds of documentation, in terms of verifiable facts or references to knowledgable individuals, did the students provide?

Not every student decided to list and explain three accomplishments in detail. As we noted earlier, 82 percent gave information about one accomplishment, 58 percent about two, and 35 percent about three. However, approximately 85 percent of those who responded gave: (a) the name and address of an individual who would know about their accomplishment; (b) the name of a group which could be contacted (e.g., a specific sorority in which they had worked); (c) provided some fact which could be checked (e.g., earned FCC radio third class license).

The 15 percent who did not provide information may have not done so for a variety of reasons. Examination of their responses suggests that many were reporting experiences for which there could be no real documentation, such as learning photography for ones' own enjoyment and satisfaction. Others could be verified, but there seemed little point of providing such information (for example, changing their major field to their present area of study). Finally, some students felt that providing the names and addresses of individuals who could verify their statements could represent an invasion of the privacy of those individuals; others felt that they needed to know how the information would be used before they would release it. There was no evidence to suggest that there was distortion or exaggeration of the facts provided by students. This result is consistent with a great deal of other research (cf. Baird, 1976) and with the lack of concern about students' truthfulness on the part of the faculty members and deans we interviewed.

Evaluation of the Inventory

Since one of the goals of this phase of the project was to obtain the evaluations of the inventory by people who might use it, we sought a variety of information. This section summarizes these evaluations. They include: first, students' responses to evaluation items that were included in the inventory; second, their comments, which were solicited in the inventory; third, interviews with undergraduates; fourth, interviews with graduate students; fifth, interviews with graduate faculty; and sixth, interviews with graduate deans.

1. Responses to survey items. At the end of the inventory, students were asked five questions about it. Their responses are summarized in Table 15. Most students had understood the purpose of the inventory with only 6 percent indicating that they had not. However, opinion was more divided about whether the time needed to complete the inventory would be well spent by applicants to graduate school. Although 62 percent had positive reactions, 35 percent had negative reactions. Students' opinions were even more divided about the desirability of having the inventory available as part of routine application procedures: 56 percent were positive, but 41 percent were negative. Essentially the same number of students felt the inventory did not allow them to present an accurate picture of their activities and accomplishments as felt it did. Some possible reasons for these negative responses will be described in the next section on students' comments. The different perspectives held by students who are enrolled in graduate school and applicants to graduate school may also affect these results (see discussion of interviews.)

Another aspect of the inventory that could have considerable consequences for its operational use was the difficulty of completing it. As shown in Table 15, the great majority of students completed the inventory in less than an hour, and nearly half completed it in 30 minutes or less.

Table 15

Responses to Evaluation Items

	N	Percentage
Did you understand the purpose of the inventory?		
Yes	217	70
No, not really	19	6
Only generally, but I was not sure how it would be used	62	20
No response	10	3
If you were filling out the question naire as an applicant to graduate school, would you consider the time needed to complete it to be well spent?		
Definitely	60	19
Yes, with reservations	132	43
No, with reservations	73	24
Definitely not	34	11
No response	9	3
Would you like to have a survey like this available as part of routine application procedures?		
Definitely	48	16
Yes, with reservations	123	40
No, with reservations	79	26
Definitely not	46	15
No response	12	4

	N	Percentage
Do you feel that the inventory allows you to present an accurate picture of your activities and accomplishments?		
Yes	148	48
No	144	47
No response	16	5
About how long did it take you to complete the survey?		
30 minutes or less	136	47
31-60 minutes	117	41
61-90 minutes	23	8
More than 90	11	4

Range: 5 to 200 minutes

2. Comments on the inventory. Many students commented about the inventory (approximately half the sample commented on the survey in response to requests after items 2, 3, and 4 in Table 15 that they do so). These comments supported the picture of ambivalence shown in the evaluation items. For example, many students commented that the kind of information obtained by the inventory was already included in ordinary application procedures: "some universities already do this;" "application forms now provide space to list extracurricular activities, so I see no need for another survey;" "The statement of purpose gets this." Others felt that personal essays or resumes, already required by some departments would be better than the inventory: "Takes as long to do as an essay, but is not as satisfactory. If this were institutionalized, schools would vary the formats and grade experiences. Also, if ETS did it, it would be too expensive;" "Essay allows students to describe themselves and their activities better;" "a curriculum vitae would be better;" "Results will be poorly organized; resumes are much cleaner--a lot is lost by marking number of accomplishments rather than outlining trends." This last point was related to another common theme, that the inventory presented fragmentary information about students, and that some way was needed for students to tie their experiences together: "There would be so much individual variation in the approach to filling out this form that confusion and misunderstanding would be created. Such confusion would not exist when students express themselves in their own words. A free form essay would be better." "more room for elaboration is needed;" "Too fragmented. Need chance to convey a cohesive version of experiences." "Can't tell what was significant for me and why." "I would rather have a chance to explain my overarching interests rather than have a reader infer these from marks on a questionnaire."

A number of students felt that the inventory placed too much emphasis on public recognition and awards for accomplishments rather than experiences that were personally significant: "Many activities are processes rather than events...many are private, such as studying piano." "My interests in music and literature are too personal to be evaluated by an inventory of any type." "Needs more questions about accomplishments that have not been rewarded by awards, prizes, especially those in which the person was a volunteer or in which people were active members but not officers." "Too centered on achievements and products--a minimal aspect of creative endeavor for most of us. What about religious involvement? Life is not a series of accomplishments, and my life has been influenced by a myriad of factors, especially other people." "Whole emphasis on enumerating accomplishments and awards is misplaced and artifical. There is no sign of the importance of involvement in the activity. The logic is off--selling a work of art is not evidence for its quality."

"The emphasis on numbers of accomplishments is offensive." "Although the idea of a codable inventory is probably attractive to admissions committees it is obnoxious to the candidate as to what he has done and why it is important."

Although the inventory included a wide range of activities, some students nevertheless felt that it was too narrowly academic: "This is for academic activities, but not for social experiences, which often do not have tangible goals;" "perhaps more focus on job experience may be useful;" "Needs more on nonacademic and personal accomplishments that were not done for public recognition;" "Skills beyond the academic sphere are what is important, especially the intensity of emotion and satisfaction;" "Many nonacademic areas aren't covered, for example, travel, that merges into education." (However, a few students felt that the emphasis was too nonacademic: "This is not suited for students who have done nothing but go to school;" "In general the form is OK, but my achievements were mainly scholastic").

Some students felt that the inventory would not be appropriate for some students because they would have insufficient time for activities: "Not fair to students who worked their way through college and had little time for extracurricular activities, but who learn a lot about discipline, ambition, self-motivation, human nature, the working world, and responsibility to others;" "Extenuating circumstances may limit a person's opportunity to learn music, art appreciation, etc. Those kind of experiences should not be weighed too heavily." "Many undergraduate students pursuing very difficult courses, such as chemistry, biology, and pre-med, have little free time outside class. The ability to cope with intensive pressures and to succeed academically is very important in graduate study;" "The inventory is too geared toward single students. Mothers have little chance to do much beyond raise kids;" "Would give advantage to older students who have had more time to do things, would also favor affluent students."

There were some assorted comments about the actual operations or usage of the inventory: "Depends on number of duplications;" "It's OK, if other parts of applications were dropped;" "OK to use this if one only filled out the sections that added to an admissions committee's picture of me;" " only if optional;" "Covered too wide an area--maybe specific humanities, science, social science packets would be better;" "Too broad, there is not enough on specific skills and experiences most relevant to different areas of study."

Finally, some students doubted that the inventory would actually be used by graduate admissions committees: "I'm not sure this would affect applications. Graduate departments do not care about students' activities outside of their field of study. If they did, they would require such information already;" "I'm not sure admissions committees would regard this as important;" "I can't see how this would be used by admissions committees;" "I doubt that this information would be given enough weight in admissions to warrant the time needed to complete the form;" "I don't think it would make a great deal of difference in admissions;" "I was honest in my responses, especially in Part Five, but I doubt that such honesty would impress graduate committees."

Summary of Interview Evaluations of Inventory

3. Undergraduates. Most undergraduates reported that they did not know what happens in the admissions process. They were unsure of criteria used to select students for graduate study. In most cases, they were not sure how selective were the departments to which they were applying.

Perhaps because undergraduates were relatively naive and ready to do anything to embellish their applications so that they would receive a favorable decision, they said they would be eager to fill out such an inventory. They felt that many of the accomplishments and activities they might cite in the inventory would not receive much attention in the usual application process: "Unlike the rest of the application materials, it does not force you to "fake" on the essay of intent things that you know that the graduate school wants to hear about you." Others expressed feelings of intimidation. "I have been too busy making grades as an undergraduate to get involved with anything else. Most of my achievements were in high school. I have little to report, so this inventory makes me look like a clod." Some students cticicized the language and focus--"the inventory is too academic." Reservations were expressed about the "scoring" of these inventories. Students did not want to be ranked with their fellow students in terms of levels and numbers of achievements. They especially did not want their responses to be scored centrally "by a company like ETS." The majority preferred to have their responses summarized by a computer printout of each item, and let the graduate admissions committee or the graduate school decide how they wanted to use this information.

Students suggested that whether or not the inventory becomes a GRE service, a book on how to apply to graduate school would be extremely helpful. The inventory could be included in the book, along with suggested fields of study and how fields might differ in their required activities and accomplishments.

4. Graduates. Recently admitted graduate students seemed more blase and sophisticated about admissions than undergraduates, but they were as unsure of how they were admitted as were the undergraduates. They mentioned grades, GRE scores, and accomplishments as reasons for their selection in order to reconstruct the decision-making process in ways that were logical to them. Once they were selected they could estimate the selectivity of their respective departments based on their own ability and their perceptions of the ability of their classmates. Many noted that they were disappointed when they found out their departments were not highly selective (some took anyone that applied).

Graduate students were more critical of the inventory. Some major criticisms were:

1. The questions were too personal.
2. Who is to decide what learning activity or accomplishment is important or significant to the individual and his or her professional work--the student or the faculty?
3. The inventory focuses on publically recognized accomplishments, rather than personal accomplishments.
4. The booklet is too long. The inventory takes a long time to complete because students had to spend much time in remembering past activities.
5. The inventory does not touch upon survival skills and motivation.
6. Items should be arranged in hierarchical order with frequent accomplishments preceding less frequently expected ones.
7. The word "accomplishments" is intimidating, and any truly outstanding accomplishments or awards would be reported any way.
8. There were too few items related to work or job accomplishments.
9. The coverage of the survey was too broad; there should be shorter lists geared for specific fields.
10. The format was restricting and there was not enough room to answer the open-ended questions fully.
11. The inventory should be prefaced by a nonthreatening introduction.

However, students were more positive about the fact that the inventory allowed them to report their "extra-academic" activities. Some felt it helped them overcome their self-consciousness. They felt that the inventory had some overlap with the letter of intent but was sufficiently different from the latter to give them an opportunity to report unique information about themselves. Also, it reminded them of things they had done that they would have forgotten to tell the graduate schools. For this reason, it was thought by students to be a good self-assessment tool that could be used in preparation to applying to graduate schools.

Students seemed to be equally divided in their opinion about how results should be reported to institutions. A number of students felt an impartial evaluation by ETS was better than leaving the interpretation to graduate departments. These students felt the inventory would be an application procedure to which they could respond more freely and honestly if it was administered under the name of ETS and GRE. On the other hand, some students did not like centralized scoring and preferred the interpretation to reside in the graduate departments; however if this was the case, they suggested that detailed interpretive information should be provided before operationalizing the document.

5. Graduate faculty. Faculty members were extremely candid in their criticisms. At the same time, they were pleased that ETS was conducting such a project since, in general, they felt that there were serious problems in using GRE scores and grades. These problems tended to be slightly different depending on the field and level of graduate education. At one institution where a panel interview was conducted, faculty openly admitted that 10 percent of the master degree students in the programs were not capable of doing graduate quality work and 25 percent of the doctoral students were "washouts."

Faculty were asked if there was any one thing that, in their experience, was the best predictor of graduate school achievement. English faculty generally felt that, in the words of one, "love of the written word" or experience with writing (not necessarily published) was an important factor. Clinical psychology faculty pointed to "maturity" and experience with activities that involved interpersonal skills (e.g., sales, club work, counseling). Biology faculty were not sure that lab experience were all that important to successful graduate study. In general, they felt that any activities that promoted self-reliance, self-directed study, and a sense of responsibility, no matter what the setting, were important predictors of successful graduate study in their field. Such activities and attributes are important considerations when a student is in the "gray area" or he or she is not a known quantity as evidenced by scores, grades, or reputation of the sending undergraduate institution.

A major criticism of the inventory by faculty members was that the instrument tried to list too many activities and too great a variety. It was suggested that each discipline have its own inventory. Psychology faculty, in particular, felt that the variety of subspecialties within their field made it difficult to use one form or standard approach in admissions. For example, clinical work demanded evidence of interpersonal skills and organizational psychology required work in large organizations. Further, experimental psychology demanded a good deal of laboratory experience.

Some faculty felt that their present procedures were adequate, particularly those in English who rely heavily on the written statement of purpose.

In less selective departments where few if any applicants are rejected, faculty suggested that the inventory can serve to inform faculty about characteristics of the incoming students. Several faculty suggested that the inventory could substitute for an interview when it is not possible to see the student.

6. Graduate deans. Without exception the graduate deans and associate deans who participated in the interviews were enthusiastic about the study. In general, they were not as critical about the inventory as the graduate faculty members. However, they did feel that much additional research and study would be needed for the inventory to be important in the admissions process. "Most faculty will want to know the predictive power of the inventory. Do students who record certain accomplishments in fact accomplish much in graduate school and are they successful graduate students?"

One dean suggested that we do a concurrent validity study. "Do research like that done on the SVIB. Give people who are rated successful in a field the inventory and compare these responses to those who have not entered the profession." The deans were not sure whether they preferred students who were generalized and had a breadth of accomplishments or those who exhibited depth in their activities. In the long run, they felt that both types would contribute to their respective departments.

The deans felt faculty members would have to be trained to interpret the responses and make decisions about students. One suggestion was that a manual be devised for faculty members that contained five or six case studies of various individuals, for example, the hypothetical case of John Jones who had high GRE scores, a very low GPA and poor writing ability. Attached to this information there would be an inventory report. The manual could describe approaches to making decisions, using this hypothetical data, so that faculty would be familiar with the inventory results before using them in practice.

Most deans felt that faculty members did not have enough time to read an entire booklet. There would have to be some type of succinct summary of what was in the booklet. This should be more than a listing of the inventory items that were checked by a student. The report to the faculty would have to say more than just what the student reported. It would have to be evaluative.

Deans as well as faculty members felt that a score report was not an appropriate format to summarize the inventory responses. They all seem to feel, however, that there had to be some anchor points, a data base, or a comparative statement or number that would give the receiver of the report some notion of how a particular student fared out of all students applying for graduate school in a particular field or in graduate school in general. At the least, there should be some way to know that certain accomplishments are rare events and indicate highly accomplished people who do succeed and certain accomplishments are frequent events and indicate another type of student. Research might show that "high accomplishers" drop out of graduate school and that people who are in the middle range are the ones most likely to steadily pursue graduate study and continue to accomplish and to do various activities. Some faculty members suggested that a narrative describing the student that was based on his or her inventory responses would be helpful.

It seems reasonable to think that a wider sampling of deans and faculty would find some who have doubts about the accuracy and honesty of the respondents, but, among those we interviewed there was not much concern with exaggerated self-reports. The deans (and faculty) interviewed felt that students would be no more dishonest in their inventory responses than they would in any other aspect of the application process. On the other hand, students felt their fellow applicants could not always be trusted for accurate information.

Discussion

The purposes of this project, as outlined by Baird (1979) were the following:

(1) To develop comprehensive, concise, and accurate descriptions of the significant accomplishments of applicants. Recognizing that graduate schools have always given attention to students' performance over and beyond traditional academic qualifications, there is a need for systematic ways to evaluate the noninstitution learning and activities of students so that students with the best potential for outstanding graduate and career performance can be selected.

(2) To broaden recognition of alternate forms of talent, which may be somewhat removed from purely academic ability. Again, although graduate schools have commonly given attention to these kinds of talent, there is a need for more effective methods of assessing this talent and thereby increasing its salience in the admissions process.

(3) To provide graduate admissions committees with more appropriate information in order to better evaluate the accomplishments of students with special characteristics or preparation, such as minority students and older students. The goal was not only to provide a systematic reporting procedure so that admissions committees can evaluate these students more fairly, but also to provide students with a better opportunity to present evidence of talents they feel are personally significant and worthy of attention.

The more specific goals of this phase of the project were to estimate the degree to which information about pregraduate school accomplishments predict graduate school success, examine the possibility of streamlining the inventory, study ways to most appropriately administer and use the inventory, and examine the most useful ways of analyzing and interpreting students' responses, and reporting the results. To what extent did the study reported in the previous pages serve these purposes?

1. Did the survey assess students' significant attainments prior to graduate school in a comprehensive, concise, accurate and systematic way? The responses to the main part of the survey were plausible in the frequency of attainments, the differences between fields, their intercorrelations, and in terms of the

evidence supplied as documentation. Study of the character of the responses suggest that almost all students completed the survey conscientiously and completely. Together, these results suggest that the survey did gain information about many significant accomplishments, and that the inventory could provide a concise and accurate method for assessing pregraduate accomplishments. In addition, the free-response questions allowed students to present a great variety and depth of information about the accomplishments they felt were personally significant. Analyses of these free-response achievements suggested that two areas of significant student activity could be given greater emphasis in the inventory: work experience and academic experience broadly defined. Thus, any assessment like the inventory should ask more questions about these areas.

Related to the question of comprehensiveness, student responses to the evaluation items suggested that some students felt that the present form of the inventory did not allow them to provide a comprehensive picture of themselves and their interests, and did not allow them to indicate the value they placed on an achievement or experience, especially the more personal kind (although that was precisely the point of the free-response questions about significant accomplishments). Some students also felt that the inventory emphasized quantity and tangible products rather than quality and depth, suggesting that something like the presently required personal statement might do the job better. Others, however, felt that the inventory added to present information. Furthermore, faculty members also recognized that the inventory collects information systematically, and organizes it in ways that increase its salience for decision-making. They also recognized that the inventory gave students an equal chance to describe themselves, in contrast to personal statements which are dependent on students' ability to dramatize their attainments. Thus, in sum, it appears that the inventory does meet this first purpose, even though further work could lead to improvements.

2. Did the inventory identify indicators of broader kinds of talent? The statistical results for both the items and the four scales indicated that they were basically unrelated to undergraduate grades. Thus, the inventory did provide systematic information about indicators of "nonacademic" talents that might not appear in the ordinary transcript. Furthermore, the evidence provided by the short-term prediction study indicated that these indicators were correlated with the graduate school attainments of students, whereas undergraduate grades were not. Although this is undoubtedly partly due to the attenuation in the range of grades, it is worth noting that undergraduate grades still correlated .30 with graduate grades, which also had a small variance. Although some of the graduate school

attainments were fairly rare and the time span covered only the first year of study, the inventory predicted these attainments with moderate success. It may be that a follow up after several years might produce higher correlations as students have more opportunities for accomplishment in later years of study.

3. Would the inventory supply information useful in the fair evaluation of applicants with special characteristics? In the development of the inventory, a strong effort was made to incorporate the revisions suggested by reviewers from various groups to make the content and phrasing as fair as possible. The results of the analyses of both the items and scale scores showed some differences between men and women students, and among students of different ethnic backgrounds. However, in each case the groups "balanced out;" although men were high in the scientific and technical areas, women were high in the artistic and social service areas; although whites were high in science, blacks were high in social service and organizational activities. Furthermore, students with different grades and students of different ages did not differ significantly on any of the scales. Finally, the differences between students with different personal characteristics were typically much smaller than the differences among the fields. This evidence suggests that the inventory provides an overall description of students that, taken as a whole, allows students with different characteristics to tell admissions committees what they are good at and what they have done. The issue of fairness is very complex, and much work would be needed to show that the inventory is unbiased in every sense, but these results seem promising.

The more specific goals of the project also were generally met. A careful analysis of students' written responses to both the detailed questions and the free response questions suggested accuracy in students' self-reports. For example, when asked to provide documentation, students did provide sufficient information to allow a check on their responses. Although a complete check of students' reponses was not conducted for reasons of cost, the character of the responses suggested that they were responding in good faith and as clearly as their understanding of the instructions allowed. There also seemed to be little exaggeration (e.g., no one claimed to have published an article in Atlantic magazine, but some said they had published an article in their college literary magazine). Although the inventory would have to be used in actual admissions situations and a study of the verification of students' claims conducted to provide a definitive final answer, these results suggest that most students responded as accurately as they could.

The inventory could probably be made more efficient and streamlined. First, certain achievements were so rare that the items about them could probably be eliminated. Furthermore, some items were unrelated to any graduate school attainment and could probably be eliminated on those grounds. In addition, some activities or products are so seldom entered in contests, sold, or win prizes, that such detailed questions may be unnecessary. The need for detailed documentation questions about each item (in Parts I, II, and III) also seems low, especially because the data provided there often are difficult to interpret. (In contrast, the details provided in answers in Part V were quite helpful.) It seems likely that a fairly simple and easily completed form could be developed. Even in its present form--that includes background questions and evaluation items--the great majority of students reported few problems in completing the survey, and most students were able to fill it out in half an hour or less.

The results of the study were less clear as to the most appropriate administration and use of the inventory, and the most useful ways of interpreting and reporting students' responses. Since the study was based on an examination of first-semester graduate students rather than actual applicants whose responses might be examined by admissions committees, we had no "on hands" data that were relevant to these goals. Consequently, we had to rely on our interviews with students and staff. As suggested in the description of the interviews, there was little consensus on any of these issues. It seems clear, however, that all the groups were favorable to the basic ideas behind the inventory although there was a diversity of opinion about how best to implement them. Additional work would be needed to work out the best conceptual and operational course of action in the future.

As noted, one major drawback of the study is that it was based on the responses of currently enrolled graduate students rather than applicants. Possibly, the results would be different if they were based on actual usage of the inventory in real admissions decisions.

In summary, given this caveat, the basic purposes of the project appear to have been served. A reasonably comprehensive, concise, and accurate method for assessing the pregraduate school accomplishments of applicants was developed. The method appears to be fair, at least on initial indications, and to correlate with graduate school success, broadly defined. Student and staff comments resulted in a variety of suggestions for improvements. Ways to implement those suggestions to provide some tools for better admissions practice are currently being pursued with the advice of people directly concerned with graduate admissions.

References

Albright, L. E., & Glennon, J. R. Personal history correlates of physical scientists' career aspirations. Journal of Applied Psychology, 1961, 45, 281-284.

American College Testing Program. Assessing students on the way to college. Author, Iowa City: Iowa, 1973.

Anastasi, A., & Schaeffer, C. E. Biographical correlates of artistic and literary creativity in adolescent girls. Journal of Applied Psychology, 1969, 53, 267-273.

Baird, L. L. Family income and the characteristics of college-bound students. ACT Research Report No. 17, Iowa City: American College Testing Program, 1967.

Baird, L. L. The prediction of accomplishment in college: An exploration of the process of achievement. Journal of Counseling Psychology, 1969a, 16, 246-254.

Baird, L. L. Factors in the continuance of accomplishment from high school to college. Measurement and Evaluation in Guidance, 1969b, 2, 5-18.

Baird, L. L. Patterns of educational aspiration. ACT Research Report No. 32, Iowa City: American College Testing Program, 1969c.

Baird, L. L. Development of an Inventory of Documented Accomplishments. Proposal submitted to Graduate Record Examinations Board, 1975.

Baird, L. L. Using self-reports to predict student performance. College Board Research Monograph No. 7. New York: College Board, 1976.

Baird, L. L. Development of an inventory of documented accomplishments for graduate admissions. GRE Board Research Report, GREB No. 77-3R, 1979.

Baird, L. L. Academic ability and high level accomplishment. Princeton, N. J.: College Board Research Report, forthcoming.

Baird, L. L., & Richards, J. M., Jr. The effects of selecting college students by various kinds of high school achievements. ACT Research Report No. 23. Iowa City: American College Testing Program, 1968.

Bayer, A. E. The Black college freshman: Characteristics and recent trends. *ACE Research Reports*, *7*, No. 3, Washington: ACE, 1972.

Bayer, A. E., & Boruch, R. F. The Black student in American Colleges. *ACE Research Reports*, *4*, No. 2. Washington: ACE, 1969.

Cabrera, Y. A. *Minorities in higher education*. Niwot, Colorado: Sierra Publications, 1978.

Calahan, P. Correlates of respondent accuracy in the Denver Validity Study. *Public Opinion Quarterly*, 1968, *32*, 607-621.

Chambers, J. A. Relating personality and biographical factors to scientific creativity. *Psychological Monographs*, 1964, *67*, 7.

Chickering, A. W. *Education and identity*. San Francisco: Jossey-Bass, 1969.

Clausen, A. R. Response validity: Vote report. *Public Opinion Quarterly*, 1968, *32*, 588-606.

Elton, C. F., & Shevel, L. R. Who is talented? An analysis of achievement. *ACT Research Report No. 31*. Iowa City, Iowa: American College Testing Program, 1969.

Forrest, A., Knapp, J. E., & Pendergrass, J. Tools and methods of evaluation. In M. T. Keeton, et al., *Experiential Learning: Rationale, Characteristics, and Assessment*. San Francisco: Jossey-Bass, 1976.

Hardin, E., & Hershey, G. L. Accuracy of employee reports on changes in pay. *Journal of Applied Psychology*, 1969, *44*, 269-275.

Holland, J. L. Creative and academic performance among talented adolescents. *Journal of Educational Psychology*, 1961, *52*, 136-147.

Holland, J. L., & Nichols, R. C. Prediction of academic and extracurricular achievement in college. *Journal of Educational Psychology*, 1964, *55*, 55-65.

Holland, J. L., & Richards, J. M., Jr. Academic and nonacademic accomplishment in a representative sample of students taking the American College Tests. *College and University*, 1967, *43*, 60-71.

Holmstrom, E. I. Low income students: Do they differ from "typical" undergraduates? ACE Research Reports, 8, No. 5, Washington: ACE, 1973.

Knapp, J. A guide for assessing prior experience through portfolios. CAEL Working Paper No. 6, Princeton, N. J.: Educational Testing Service, 1975.

Kulberg, G. E., & Owens, W. A. Some life history antecedents of engineering interests. Journal of Educational Psychology, 1960, 51, 26-31.

MacKinnon, D. W. The nature and nurture of creative talent. American Psychologist, 1962, 17, 484-495.

Maxey, E. M., & Ormsby, V. J. The accuracy of self-report information collected on the ACT Test Battery: High school grades and items of nonacademic achievement, ACT Research Report No. 45. Iowa City, Iowa: Author, 1971.

McDermid, C. D. Some correlates of creativity in engineering personnel. Journal of Applied Psychology, 1965, 49, 14-19.

Morrison, R. F., Owens, W. A., Glennon, J. R., & Albright, L. E. Factored life history antecedents of industrial research performance. Journal of Applied Psychology, 1962, 46, 281-284.

Mosel, J. N., & Cozan, L. W. The accuracy of application blank work histories. Journal of Applied Psychology, 1952, 36, 365-369.

Munday, L. A., & Davis, J. C. Varieties of achievement after college: Perspective on the meaning of academic talent. ACT Research Report No. 57. Iowa City, Iowa: Author, 1974.

Nichols, R. C. Non-intellective predictors of achievement in college. Educational and Psychological Measurement, 1966, 26, 899-915.

Nichols, R. C., & Holland, J. L. Prediction of the first-year college performance of high aptitude students. Psychological Monographs, 1963, 77 (7, Whole No. 570).

Richards, J. M., Jr., Holland, J. L., & Lutz, S. W. Prediction of student accomplishment in college. Journal of Educational Psychology, 1967, 58, 343-355.

Richards, J. M., Jr., & Lutz, S. W. Predicting student accomplishment in college from the ACT assessment. Journal of Educational Measurement, 1968, 5, 17-29.

Roberts, R. J. Prediction of college performance of superior students. NMSC Research Reports, 1965, 1, No. 5,National Merit Scholarship Corporation.

Roe, A. The making of a scientist. New York: Dodd, Mead, 1952.

Schaefer, C. E. The prediction of creative achievement from a biographical inventory. Educational and Psychological Measurement, 1969, 29, 431-437.

Schaefer, C. E., & Anastasi, A. A biographical inventory for identifying creativity in adolescent boys. Journal of Applied Psychology, 1968, 52, 42-48.

Shultz, C. B., & Skager, R. W. Relationship of an independent activities questionnaire to performance during high school. Research Bulletin 63-16, Princeton, N.J.: Educational Testing Service, 1963.

Skager, R. W., Schultz, C. B., & Klein, S. P. Quality and quantity of accomplishments as measures of creativity. Journal of Educational Psychology, 1965, 56, 31-39.

Taylor, C. W., & Ellison, R. L. Biographical predictors of scientific performance. Science, 1967, 155, 1075-1080.

Wallach, M. A., & Wing, C. S., Jr. The talented student: A validation of the creativity-intelligence distinction. New York: Holt, Rinehart and Winston, 1969.

Walsh, W. B. Validity of self-report. Journal of Counseling Psychology, 1967, 14, 18-23.

Walsh, W. B. Validity of self-report: Another look. Journal of Counseling Psychology, 1968, 15, 180-186.

Walsh, W. B. Self-report under socially undesirable and distortion conditions. Journal of Counseling Psychology, 1969, 16, 569-574.

Ward, W. C., & Frederiksen, N. A study of the predictive validity of the tests of scientific thinking. GRE Board Professional Report GREB No. 74-6P, 1977.

Whitaker, U. G. Assessors and their qualifications. In M. T. Keeton, et al., Experiential learning: Rationale, characteristics, and assessment. San Francisco: Jossey-Bass, 1976.

Willingham, W. W. Predicting success in graduate education. Science, 1974, 183, 273-278.

Appendix A

Name: ____________________

University: ____________________

Department: ____________________

Inventory of Activities and Accomplishments

Graduate Record Examinations Board

Educational Testing Service
Princeton, New Jersey 08541

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BACKGROUND QUESTIONS

The following questions will be used for research purposes only. Your responses will be used to help us identify items that might be unfair to various groups of students and to help us understand the results of the study. They will not be used in any other way, will not be communicated to your department or university, and will not be seen by anyone except the research staff. We encourage you to answer all the questions so that the results of the study will be more accurate.

1. In what year did you receive your bachelor's degree?

____

2. What was the full name and location of the college that awarded your bachelor's degree?

Name ______________________________

Location ______________________________

3. Was your undergraduate major in the same field you are now studying as a graduate student?

○ Yes

○ No

4. What was your undergraduate major?

____

5. Considering only your last two undergraduate years, approximately what overall grade average did you receive? (If your college does not use letter grades, please mark the letter grade that is the closest equivalent to your grade average.)

○ D or lower

○ C-

○ C

○ B-

○ B

○ A-

○ A

6. Have you attended another graduate institution on at least a half-time basis?

○ No

○ Yes, for less than a year

○ Yes, for a year or more

○ Yes, and I obtained a Master's degree

7. What is your eventual graduate degree objective in your current field?

○ Non degree study
○ Master's (M.A., M.S., M.Ed., etc.)
○ Intermediate (such as Specialist)
○ Doctorate (Ph.D., Ed.D., etc.)
○ Postdoctoral study

8. What kind of position do you hope to hold on completion of graduate school? If you are considering more than one, mark one first preference.

○ Postdoctoral fellowship
○ Teaching or administration in elementary or secondary school
○ Teaching in junior college
○ Teaching in a four-year college or university
○ University research and teaching
○ College or university administration
○ Research in industry or with non-profit organization or institute
○ Self-employed professional practice
○ Professional practice with a clinic, hospital, or agency
○ Executive position (administrator, curator, etc.) in a nonacademic organization including government
○ Other (Specify):________________

____

9. On the average, how many hours a week did you work during your last two years of undergraduate college?

○ Did not work
○ 1-10 hours
○ 11-20 hours
○ 21 or more hours

10. Did you work between the time you graduated from college and the time you entered graduate school?

○ No
○ Yes, but only part-time for less than six months
○ Yes, part-time up to a year
○ Yes, full-time for less than six months
○ Yes, full-time up to a year
○ Yes, full- or part-time for more than a year

11. What is your sex?

○ Male
○ Female

12. What is your age?

____

13. Are you a United States citizen?

○ Yes
○ No

14. How do you describe yourself?

○ American Indian or Native American
○ Black, Afro-American or Negro
○ Mexican-American or Chicano
○ Oriental or Asian-American
○ Puerto Rican or Spanish-speaking American
○ White or Caucasian
○ Other

Section I

The questions in this section refer to writing and publishing activities. Answer each question by BLACKENING THE APPROPRIATE CIRCLE after each question.

If you indicate below that you have engaged in a listed activity, please provide all the information about the activity as requested by the columns. If you indicate

In college or prior to applying to graduate school, did you:	Have you engaged in this activity? If you mark "Yes," fill in the rows at right		When?	
	No	Yes	During college	After college
1. Write a short story.	○	○	○	○
2. Write a poem.	○	○	○	○
3. Write a play.	○	○	○	○
4. Write a "literary" article or essay.	○	○	○	○
5. Write a scientific article.	○	○	○	○
6. Write a "general" article, (e.g., newspaper report, editorial, pamphlet).	○	○	○	○
7. Write a book dealing with some aspect of the sciences or social sciences.	○	○	○	○
8. Write a "literary" book, (e.g., novel, book dealing with social issues).	○	○	○	○
9. Author or coauthor an article presented at a professional meeting or conference. (Fill in the name of the professional association on the line at the right.)	○	○	○	○
10. Compose a symphony, concerto, or sonata.	○	○	○	○
11. Compose a "popular" song or "show" tune.	○	○	○	○
12. Draw cartoons or illustrations.	○	○	○	○
13. Obtain a patent or patent disclosure.	○	○	○	○
14. Take photographs for a newspaper or magazine.	○	○	○	○
15. Work as editor of a publication.	○	○	○	○

that you did not engage in the activity by marking "No," go on to the next question.

If you engaged in a listed activity more than once, describe the one that you feel achieved the most recognition.

Was this part of a college assignment?		How widely was it circulated?				If published, fill in the name of the publication or publisher. PLEASE PRINT.	Number of other similar works.					
No	Yes	Never published	Local Community, School, or College	Several Communities, Schools, or Colleges	Nationally		None	One	Two	Three-five	Six-eight	Nine or more
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○
○	○	○	○	○	○	____________	○	○	○	○	○	○

Section II

This section deals with contests, exhibits, and certain kinds of public performances. Answer each question by BLACKENING THE APPROPRIATE CIRCLE after each question.

If you indicate below that you have engaged in a listed activity, please provide all the information about the activity as requested by the columns. If you indicate

	Have you engaged in this activity? If you mark "Yes," fill in the rows at right		When?		Was this part of a college assignment?		With whom did you do it?	
	No	Yes	During college	After college	No	Yes	Alone	Group
In college or prior to applying to graduate school, did you:								
1. Build a scientific apparatus or device (e.g., microscope, spectroscope).	○	○	○	○	○	○	○	○
2. Design or invent a piece of machinery, scientific apparatus, or electronic equipment.	○	○	○	○	○	○	○	○
3. Work out original solutions to mathematical problems (e.g., proofs for theorems or propositions not given by the instructor or textbook).	○	○	○	○	○	○	○	○
4. Repeat a known scientific procedure or demonstration (e.g., identification of elements or biological specimens).	○	○	○	○	○	○	○	○
5. Conduct an original scientific experiment.	○	○	○	○	○	○	○	○
6. Collect scientific specimens (e.g., fossils, rocks, microscopic slides, photographs of star movements).	○	○	○	○	○	○	○	○

that you did not engage in the activity by marking "No," go on to the next question.

If you engaged in a listed activity more than once, describe the one that you feel achieved the most recognition.

Did you receive payment for this activity?		If you engaged in this activity in a contest or exhibit, describe the geographical area covered by it.				Did you win a prize?					Number of similar achievements.		
No	Yes	Local community or college	Large city or region of state	Statewide	National or international	None	Honorable mention or equivalent	Prize other than first prize	First prize	Fill in name of the contest or exhibit sponsor (e.g., National Science Foundation). PLEASE PRINT	None	One-two	Three or more
○	○	○	○	○	○	○	○	○	○	______________________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________________	○	○	○

Section II, cont'd.

In college or prior to applying to graduate school, did you:	Have you engaged in this activity? If you mark "Yes," fill in the rows at right		When?		Was this part of a college assignment?		With whom did you do it?	
	No	Yes	During college	After college	No	Yes	Alone	Group
7. Give a public musical performance.	○	○	○	○	○	○	○	○
8. Arrange or compose music (e.g., folk songs.)	○	○	○	○	○	○	○	○
9. Enter a literary contest.	○	○	○	○	○	○	○	○
10. Produce original writing (e.g., fiction, nonfiction, poems, plays)	○	○	○	○	○	○	○	○
11. Enter a photography exhibit or contest.	○	○	○	○	○	○	○	○
12. Publicly display your drawings, cartoons, paintings, sculptures, or other fine arts work.	○	○	○	○	○	○	○	○
13. Enter an architectural contest or exhibition with original designs, building structures, or floor plans	○	○	○	○	○	○	○	○
14. Publicly display objects that you designed and made.	○	○	○	○	○	○	○	○
15. Enter a public speaking or debating contest.	○	○	○	○	○	○	○	○
16. Publicly perform or choreograph artistic dancing (e.g., ballet, modern dance, foreign dance).	○	○	○	○	○	○	○	○
17. Act in a play or movie.	○	○	○	○	○	○	○	○
18. Direct a play, movie, modern dance, or ballet.	○	○	○	○	○	○	○	○
19. Deliver a speech.	○	○	○	○	○	○	○	○

Did you receive payment for this activity?		If you engaged in this activity in a contest or exhibit, describe the geographical area covered by it.				Did you win a prize?					Number of similar achievements.		
No	Yes	Local community or college	Large city or region of state	Statewide	National or international	None	Honorable mention or equivalent	Prize other than first prize	First prize	Fill in name of the contest or exhibit sponsor (e.g., National Science Foundation). PLEASE PRINT.	None	One-two	Three or more
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○
○	○	○	○	○	○	○	○	○	○	______________	○	○	○

Section III

The questions in this section refer to artistic or scientific objects or products you may have produced and for which you may have received payment. Answer each question by BLACKENING THE APPROPRIATE CIRCLE after each question.

If you indicate below that you have engaged in a listed activity, please provide all the information about the activity as requested by the columns. If you indicate

In college or prior to applying to graduate school, did you:	Have you engaged in this activity? If you mark "Yes," fill in rows at right.		When?		Was this part of a college assignment?	
	No	Yes	During college	After college	No	Yes
1. Make your own works of art (e.g. paintings, sculpture).	○	○	○	○	○	○
2. Make your own handicrafts items (e.g., jewelry, needlework, weaving, leather goods).	○	○	○	○	○	○
3. Design objects for use by others (e.g., program covers, stage settings, furniture)	○	○	○	○	○	○
4. Take photographs, movies, or slides.	○	○	○	○	○	○
5. Build musical instruments	○	○	○	○	○	○
6. Build electronic equipment from your own design (e.g., radio, spectroscope).	○	○	○	○	○	○
7. Build mechanical devices from your own design (e.g., hydraulic pump).	○	○	○	○	○	○
8. Design buildings, boats, toys, equipment, or automobiles.	○	○	○	○	○	○
9. Design and construct clothing.	○	○	○	○	○	○
10. Design interiors of rooms and buildings.	○	○	○	○	○	○

that you did not engage in the activity by marking "No," go on to the next question.

If you engaged in a listed activity more than once, describe the one that you feel achieved the most recognition.

Have you ever sold any of these products? If "Yes," answer rows at right.		Geographical area from which you drew your customers.					Numbers of times you sold similar items before you applied to graduate school.				
No	Yes	Local community or college	Large city or region of state	Statewide	National or international	Type of product (ceramics, etc.).	One	Two	Three-five	Six-eight	Nine or more
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○
○	○	○	○	○	○		○	○	○	○	○

Section IV

This section deals with certain special paid or unpaid activities such as jobs, volunteer work, military activities that you may have engaged in and/or offices you may have held during college or before applying to graduate school. Please

1. Have you held a job that taught you an important skill?

2. Have you received a job promotion for outstanding performance?

3. Have you had major responsibility for another person (e.g., custodial care, emergency squad, parenting)?

4. Have you held a position in a group that tried to influence social institutions?

5. Have you been an active member of a group in which you had to interact closely with other people (e.g., youth counseling, camp counseling, church activities, community organizations)?

6. Have you supervised a group of volunteers (e.g., in a political campaign, neighborhood program for children, church organizations)?

7. Have you raised or managed money for an organization or project (e.g., community fund drive, served as treasurer of a club)?

8. Have you won an athletic award?

9. Have you participated in athletics (e.g., coached, managed, or played on a team or in a tournament)?

10. Have you been elected to a major class office (e.g., president, vice president, treasurer)?

11. Have you been appointed or elected a member of a college-wide student group, such as student council or student senate?

12. Have you been an elected officer in a community social group?

13. Have you served on a student-faculty committee?

blacken completely one circle next to your answer for each question. If you mark any "Yes" answers, please fill in the requested information in terms of the activity or role that you feel is most significant.

No	Yes	If you marked "Yes," please fill in the .....
○	○	Nature of skill
○	○	Position you were promoted to
○	○	Nature of responsibility
○	○	Nature of group
○	○	Nature of group
○	○	Nature of group
○	○	Name of organization or project
○	○	Name of sport or activity & award
○	○	Name of sport or activity & nature of participation
○	○	Position held
○	○	Position held
○	○	Club or organization
○	○	Committee

Section IV (cont'd.)

14. Have you served as a research or laboratory assistant either in college or outside of college?

15. Have you served as a tutor for someone?

16. Have you started your own business?

17. Have you actively participated in a college, community, or religious service organization or program (e.g., served as chairman of a charity drive)?

18. Have you participated in any activities in the arts, humanities, or sciences that were not covered by this questionaire?

No	Yes	If you marked "Yes," please fill in the ....
○	○	Content area
○	○	Subject
○	○	Type of business
○	○	Sponsoring organization
○	○	Activity or achievement

Section V

Please choose up to three experiences that you consider highly significant in your preparation for graduate study, or that gave you the greatest sense of accomplishment, whether or not they appear in the preceding lists. Then, please answer the following questions for each one.

Accomplishment 1

1. Briefly describe the experience, providing specific details about where and when it occurred and how and why it was initiated.

2. What skill(s), competence (s), knowledge, or special accomplishment(s) resulted from the experience described above?

3. Can you give any evidence of the quality or level of attainment that this achievement represents (e.g., prize, certificate, letter, recognition, impact on individuals)?

4. What makes the skills, competence, or knowledge resulting from the experience or any aspect of the experience relevant or prerequisite to your graduate educational goal?

5. Give the names and locations of those individuals that are acquainted with your work in this area.

Accomplishment 2

1. Briefly describe the experience, providing specific details about where and when it occurred and how and why it was initiated.

2. What skill(s), competence (s), knowledge, or special accomplishment(s) resulted from the experience described above?

3. Can you give any evidence of the quality or level of attainment that this achievement represents (e.g., prize, certificate, letter, recognition, impact on individuals)?

4. What makes the skills, competence, or knowledge resulting from the experience or any aspect of the experience relevant or prerequisite to your graduate educational goal?

5. Give names and locations of those individuals that are acquainted with your work in this area.

Accomplishment 3

1. Briefly describe the experience, providing specific details about where and when it occurred and how and why it was initiated.

2. What skill(s), competence(s), knowledge, or special accomplishment(s) resulted from the experience described above?

3. Can you give any evidence of the quality or level of attainment that this achievement represents (e.g., prize, certificate, letter, recognition, impact on individuals)?

4. What makes the skills, competence, or knowledge resulting from the experience or any aspect of the experience relevant or prerequisite to your graduate educational goal?

5. Give names and locations of those individuals that are acquainted with your work in this area.

Evaluation of the Inventory of Activities and Accomplishments

We want to make this survey as accurate and fair as possible. You could help us do this if you spend a few minutes looking back over the questionnaire with the following questions in mind: (1) How do you feel about the whole questionnaire? (2) Were there any questions that caused you trouble because they were unclear, difficult to answer, or asked for details you could not provide? (3) Did any of the instructions cause you problems because they were unclear or confusing?

1. Did you understand the purpose of the inventory?

○ Yes
○ No, not really
○ Only generally, but I was not sure how it would be used

2. About how long did it take you to complete the survey?

________________ minutes

3. If you were filling out the questionnaire as an applicant to graduate school, would you consider the time needed to complete it to be time well spent?

○ Definitely
○ Yes, with reservations
○ No, with reservations
○ Definitely not

Comments: ____

____

____

4. Would you like to have a survey like this available as part of routine application procedures?

○ Definitely
○ Yes, with reservations
○ No, with reservations
○ Definitely not

Comments: ____

____

____

5. Do you feel that the inventory allows you to present an accurate picture of your activities and accomplishments?

○ Yes
○ No

Comments: ____

____

____

6. In the space below please list the item number of any question that caused you trouble, indicate the nature of the trouble, and provide any comments about how to improve the question.

	Nature of Problem (check as many as apply)			
Item number	Unclear	Hard to answer	Asked for details that were hard to remember	Comments
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	
	○	○	○	

7. Did any of the instructions create problems for you? If so, please list the page and section, and describe the problem (e.g., confusing, unclear, etc.). Any suggestions for improvements would be especially welcome.

Page/Section	Problem

8. Would you be willing to be interviewed about the inventory by an ETS staff member?

○ Yes ○ No

If yes, how can we contact you?

Address: ____________________

Phone number: ____________________

EDUCATIONAL TESTING SERVICE PRINCETON, N.J. 08541

609-921-9000
CABLE-EDUCTESTSVC

April 2, 1979

Dear Graduate Student:

Within the last few months you completed an inventory of your activities and accomplishments in your pre-graduate school years. Now, as we indicated then, we would like to find out what you have been doing in your first year of graduate study and your views of how much you have gained from your program.

The ultimate goal of this project is to develop ways for students applying to graduate school to tell graduate selection committees about the important experiences and accomplishments they have had. We believe that this would make graduate admissions fairer and better attuned to today's society. Would you please help us by spending a few minutes in completing this questionnaire and returning it in the envelope that accompanies it? We would appreciate your help very much.

Sincerely,

Joan Knapp
Leonard Baird

Joan Knapp
Len Baird
Project Directors

Please fill in your:

Name:____________________________

University:________________________

B-3

Please fill in your:

Name: ______________________________

University: ____________________________

1. What kind of graduate program have you attended this year?
   - ☐ a. Biology (Answer #2 and skip #3 and #4)
   - ☐ b. English (Skip #2 and #4 and answer #3)
   - ☐ c. Psychology (Skip #2 and #3 and answer #4)

2. Which of the following best describes your intended area of specialization within Biology?
   - ☐ a. General Biology
   - ☐ b. Botany
   - ☐ c. Zoology
   - ☐ d. Plant Physiology
   - ☐ e. Animal Physiology
   - ☐ f. Molecular Biology (e.g. biochemistry, biophysics, and/or biometrics)
   - ☐ g. Cell Biology
   - ☐ h. Marine Biology
   - ☐ i. Arctic Biology
   - ☐ j. Population Biology (e.g. systematics, environmental biology, and/or ecology)
   - ☐ k. Developmental Biology (e.g. embryology and/or genetics)
   - ☐ l. Microbiology
   - ☐ m. Other (Specify): ____________________

3. Which of the following best describes your intended area of specialization within English?
   - ☐ a. Old or Middle English
   - ☐ b. Renaissance or Seventeenth Century-British
   - ☐ c. Restoration or Eighteenth Century-British
   - ☐ d. Romantic - British
   - ☐ e. Victorian - British
   - ☐ f. American - Before Civil War
   - ☐ g. American - Civil War to World War I
   - ☐ h. Twentieth Century - British or American
   - ☐ i. Comparative Literature
   - ☐ j. Linguistics

3. (Continued)
☐ k. Composition and Rhetoric
☐ l. Folklore
☐ m. Creative Writing
☐ n. Literary Criticism
☐ o. Minority or Ethnic Literature
☐ p. Other (Specify): ____________________

4. Which of the following best describes your intended area of specialization within Psychology?
☐ a. Clinical
☐ b. Cognitive
☐ c. Counseling
☐ d. Developmental
☐ e. Educational
☐ f. Experimental, Comparative, or Physiological
☐ g. Measurement
☐ h. Organizational, Personnel
☐ i. Personality
☐ j. School
☐ k. Social
☐ l. Other (Specify): ____________________

5. What is your eventual graduate degree objective in your current field?
☐ a. Non-degree study
☐ b. Master's (M.A., M.S., M.Ed., etc.)
☐ c. Intermediate (such as Specialist)
☐ d. Doctorate (Ph.D., Ed.D.)
☐ e. Doctorate (D.A.)
☐ f. Doctorate (D.Psy.)
☐ g. Postdoctoral study
☐ h. Other (Specify): ____________________

(Continued)

6. What kind of position do you hope to hold on completion of graduate school? If you are considering more than one, mark one first preference.

   ☐ a. Postdoctoral fellowship

   ☐ b. Teaching or administration in elementary or secondary school

   ☐ c. Teaching in junior college

   ☐ d. Teaching in a four-year college or university

   ☐ e. University research and teaching

   ☐ f. College or university administration

   ☐ g. Research in industry or with non-profit organization or institute

   ☐ h. Self-employed professional practice

   ☐ i. Professional practice with a clinic, hospital, or agency

   ☐ j. Executive position (administrator, curator, etc.) in a non-academic organization including government

   ☐ k. Other (Specify): ____________________

7. Approximately what overall grade average have you received for your graduate work to date?

   ☐ a. A

   ☐ b. A-

   ☐ c. B+

   ☐ d. B

   ☐ e. B-

   ☐ f. C+

   ☐ g. C

   ☐ h. C- or lower

   ☐ i. No grades

8. This question is concerned with skills and competencies within the fields of psychology, English, and biology. We would like your assessment of your present level of achievement, relative to other students with a similar amount of graduate training. In each box place a number from 1 to 5, using the scale shown below.

   1. Exceptionally well prepared
   2. Above average
   3. Average
   4. Below average
   5. No experience or does not apply

8. (Continued)

☐ a. Knowledge of literature in your area of specialization

☐ b. Familiarity with bibliographic techniques in your area

☐ c. Familiarity with various modes of criticism

☐ d. Knowledge of mathematical and/or statistical techniques

☐ e. Ability to gain insight into the problems of clients or patients

☐ f. Ability to use scientific instruments and apparatus

☐ g. Ability to use scientific method

☐ h. Skill in conducting experiments with living things (e.g. plants, animals, human subjects)

☐ i. Ability to gain insight into the materials of your field

☐ j. Ability to design original research studies

☐ k. Ability to evaluate research studies

☐ l. Knowledge of theoretical approaches in your discipline

☐ m. Ability to teach complex ideas to undergraduates

☐ n. Ability to interpret research findings

☐ o. Knowledge or understanding of historical context out of which literature evolves

☐ p. Reading knowledge of foreign language

9. Which of the following have you done within the current academic year within your area of specialization? (Mark as many as apply.)

☐ a. Attended one or more meetings of a scholarly or professional society

☐ b. Subscribed to two or more scholarly or professional journals

☐ c. Been author or coauthor of a paper accepted for presentation at a meeting of a scholarly or professional society

☐ d. Been author or coauthor of a paper submitted for publication to a scholarly or professional journal

☐ e. Been author or coauthor of a paper accepted for publication by a scholarly or professional journal

☐ f. Been author or coauthor of a fiction piece

☐ g. Wrote an article for a popular magazine

☐ h. Directed or produced an actual dramatic production

☐ i. Prepared a detailed proposal or plan for a dissertation, master's thesis, or other major research project

9. (continued)

☐ j. Carried out an independent research project

☐ k. Carried out a research project in collaboration with another student or a faculty member

☐ l. Had teaching responsibility for one or more sections of an introductory undergraduate course

☐ m. Had teaching responsibility for one or more sections of an advanced undergraduate course

☐ n. Conducted a section of an undergraduate class on one or several occasions

☐ o. Frequently advised or tutored other graduate students in your field

☐ p. Assisted in editing of text or preparing of bibliographic material for a book

☐ q. Programmed a computer to analyze research data

☐ r. Prepared a course syllabus

☐ s. Entered a literary or scientific contest or competition

☐ t. Won a literary or scientific contest or competition

☐ u. Worked, interned, or did a practicum outside the environs of the campus

☐ v. Designed and built a piece of laboratory equipment

☐ w. Learned to operate or maintain a piece of electronic equipment

☐ x. Other (Specify): ____________________

10. In addition to the above, if you wish, please use the space below to cite other accomplishments within and outside your area of specialization. If additional space is needed, please write on the back.

a. ____

b. ____

Thank you

Distribution of Scores on Social Service-Organizational Activity Scale

SCORE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
0	50	16.2	16.2	16.2
1	65	21.1	21.1	37.3
2	47	15.3	15.3	52.6
3	53	17.2	17.2	69.8
4	40	13.0	13.0	82.8
5	27	8.8	8.8	91.6
6	12	3.9	3.9	95.5
7	9	2.9	2.9	98.4
8	3	1.0	1.0	99.4
9	2	0.6	0.6	100.0
TOTAL	308	100.0	100.0	

MEAN	2.565	STD ERR	0.115	MEDIAN	2.330
MODE	1.000	STD DEV	2.014	VARIANCE	4.058
KURTOSIS	-0.028	SKEWNESS	0.681	RANGE	9.000
MINIMUM	0.0	MAXIMUM	9.000		

Distribution of Scores on Scientific-Technical Scale

SCORE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
0	63	20.5	20.5	20.5
1	46	14.9	14.9	35.4
2	44	14.3	14.3	49.7
3	39	12.7	12.7	62.3
4	47	15.3	15.3	77.6
5	30	9.7	9.7	87.3
6	19	6.2	6.2	93.5
7	13	4.2	4.2	97.7
8	6	1.9	1.9	99.7
10	1	0.3	0.3	100.0
TOTAL	308	100.0	100.0	

EAN	2.766	STD ERR	0.127	MEDIAN	2.526
ODE	0.0	STD DEV	2.227	VARIANCE	4.961
URTOSIS	-0.533	SKEWNESS	0.500	RANGE	10.000
INIMUM	0.0	MAXIMUM	10.000		

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Distribution of Scores on Artistic Scale

```
                                  RELATIVE      ADJUSTED     CUMULATIVE
                    ABSOLUTE     FREQUENCY     FREQUENCY       ADJ FREQ
                    FREQUENCY    (PERCENT)     (PERCENT)      (PERCENT)
          SCORE
            0          101          32.8          32.8           32.8

            1           68          22.1          22.1           54.9

            2           52          16.9          16.9           71.8

            3           29           9.4           9.4           81.2

            4           28           9.1           9.1           90.3

            5           18           5.8           5.8           96.1

            6            9           2.9           2.9           99.0

            7            3           1.0           1.0          100.0
                    -------      -------       -------
          TOTAL        308         100.0         100.0

MEAN          1.740      STD ERR         0.101      MEDIAN          1.279
MODE          0.0        STD DEV         1.780      VARIANCE        3.170
KURTOSIS     -0.041      SKEWNESS        0.916      RANGE           7.000
MINIMUM       0.0        MAXIMUM         7.000
```

Distribution of Scores on Literary-Expressive Scale

```
                         RELATIVE    ADJUSTED   CUMULATIVE
            ABSOLUTE    FREQUENCY   FREQUENCY     ADJ FREQ
           FREQUENCY    (PERCENT)   (PERCENT)    (PERCENT)
     SCORE
      0           84        27.3        27.3         27.3

      1           45        14.6        14.6         41.9

      2           53        17.2        17.2         59.1

      3           40        13.0        13.0         72.1

      4           40        13.0        13.0         85.1

      5           16         5.2         5.2         90.3

      6           20         6.5         6.5         96.8

      7            8         2.6         2.6         99.4

      8            2         0.6         0.6        100.0
              -------    -------     -------
  TOTAL          308       100.0       100.0

AN          2.282      STD ERR      0.117      MEDIAN       1.972
IDE         0.0        STD DEV      2.052      VARIANCE     4.210
IRTOSIS    -0.489      SKEWNESS     0.640      RANGE        8.000
NIMUM       0.0        MAXIMUM      8.000
```

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Appendix D

Median Scores of Groupings of Students on Accomplishment Scales

	Scale[a]			
	LE	A	ST	SS
1. By Field				
English	3.96	.69	.25	1.43
Biology	1.42	1.97	3.89	2.23
Psychology	1.55	.86	2.62	3.03
2. By Undergraduate GPA				
A	2.20	1.00	2.00	2.39
A-	1.84	1.32	2.93	2.12
B+ and Below	1.97	1.56	2.46	2.69
3. By Sex				
Male	1.76	.99	3.18	1.97
Female	2.19	1.89	1.96	2.58
4. By Racial Group				
Black	2.33	.92	1.44	3.92
White	1.95	1.36	2.82	2.22
Other	1.95	1.00	2.25	1.86
5. By Age				
22 and Below	2.17	1.28	2.70	2.15
23-25	1.83	1.42	2.73	2.35
26 and Above	2.07	1.03	2.20	2.65

[a] LE = Literary Expressive
A = Artistic
ST = Scientific Technical
SS = Social Service and Organizational Activity

Appendix E

Examples of Students' Self-Reported Accomplishments

In the summer of 1976 I spent 2 1/2 months at the University Marine Laboratory. While there I took a graduate course in Invertebrate Embryology on the recommendation of the instructor, Dr. former director of the lab. Following the course, I did an independent research project with Dr. , also in the field of invertebrate development.

*

friendship/guidance of , just graduated with Ph.D. from Berkeley, 2 yrs. post-doc at . He was my psychology professor at who got me to work at and provided helpful suggestions at every point. (Personally I feel an experience such as this is worth more than a long list of accomplishments though your form doesn't really allow for these. A person in a field who believes in you for whatever reason is worth more than a long list of accomplishments.)

*

Worked for 2 years as a student assistant for a professor in the biology department (at --junior and senior years). I wanted to have a job and much preferred one in the department in which I was studying. The work was focused on Herbarium related studies and use of computers in that area and other areas in biology.

*

During two summer vacations and one spring break in high school I helped my brother gather data for his doctoral research in Medina, N. Dakota on the Pintail. It was initiated out of interest in his research and an excuse to visit with my brother and his wife.

*

Participant in Earthwatch expedition to Great Basin Desert, Nevada, June 76. Assisted ecologists carrying out field research--zoological and botanical. Good experience observing field work first hand.

*

I am the parent of a daughter who is now five years old. For her first three years I devoted myself to her care on a full-time basis.

*

I was co-editor of The__________, literary magazine at College, during the 1976-1977 and 1977-1978 school years. I was appointed because of superiority as an English student there.

*

Folk-singing, alone and with a male friend, in coffeehouses, small bars, park festivals, etc.--the past couple of years--self- and mutually-initiated. Involved singing, guitar, piano, original compositions.

*

Undergrad. (Career Exploration Projects) 1-month internships; Psychiatric Institute in Jan. 1974, doing occupational therapy with/ supervised by ; and at the V.A. hospital and Community Mental Health Center in , sponsored by Dr. , psychiatrist, Jan. 1975.

For two summers I have worked as a leasing agent for a large apartment complex. I took the job because it paid well and seemed interesting. My job mainly entailed greeting prospective customers over the phone and in person, show an apartment and possibly lease or take a deposit on the apartment. I worked in the summer of 1976 and 1977.

*

President--Univ. of Special Olympics Program. Program was poorly managed when I first entered as a volunteer. I wanted to see things improve, as there is a great need for athletic programs for mentally handicapped.

*

Entrance in the National Society of Arts and Letters Annual Arts Competition. In 1978, the category was literature, specifically, biographical novel. I was invited to enter the competition by the society. My partial biography was on the late Jean Despujols, French-American painter.

*

I worked at radio station, the student carrier-current station. I started in 1973 as an announcer/disc jockey and eventually served as program director. From there I earned a job at a local radio station.

*

Writing a play. The idea came when I was half-asleep, and I wrote down the plot. I worked constantly on it about five months and completed it.

*

For three summers I worked for University as a new student orientation leader. My duties included conducting campus tours; introducing students to the programs of the university, living in the dormitory as a counselor for orientation students and meeting with parents of new students.

*

The most significant experience has been teaching English as second language. I think most people should work after they get their bachelor degree (in their field of study). That gives them experience and a feeling of what they will find when they finish graduate work.

*

Membership and leadership roles in a large sorority. I pledged the sorority at the beginning of my soph. year. I was able to participate in many activities including participating on championship intramural teams and served on the executive council and in the offices of recording secretary and scholarship chairman, as well as athletic director.

*

Getting through the army with some sense of individuality and self-confidence 1972-1975, I joined because I was broke.

*

Did a bachelor's honors thesis during my senior year at College (1974-1975). Studied the effect of amphetamines on learning behavior in goldfish.

*

A poem ("Ode to a Pair of Workboots") I wrote as a junior in college won the Award for best poem by an undergraduate in the Spring, 1977, issue of "Rectangle", a national publication of English Honor Society. I wrote and submitted the work on my own, and it was published three months later.

GRE BOARD RESEARCH
REPORTS OF A TECHNICAL NATURE

Boldt, R. R. Comparison of a Bayesian and a Least Squares Method of Educational Prediction. GREB No. 70-3P, June 1975.

Campbell, J. T. and Belcher, L. H. Word Associations of Students at Predominantly White and Predominantly Black Colleges. GREB No. 71-6P, December 1975.

Campbell, J. T. and Donlon, T. F. Relationship of the Figure Location Test to Choice of Graduate Major. GREB No. 75-7P, November 1980.

Carlson, A. B.; Reilly, R. R.; Mahoney, M. H.; and Casserly, P. L. The Development and Pilot Testing of Criterion Rating Scales. GREB No. 73-1P, October 1976.

Carlson, A. B.; Evans, F.R.; and Kuykendall, N. M. The Feasibility of Common Criterion Validity Studies of the GRE. GREB No. 71-1P, July 1974.

Donlon, T. F. An Exploratory Study of the Implications of Test Speededness. GREB No. 76-9P, March 1980.

Donlon, T. F.; Reilly, R. R.; and McKee, J. D. Development of a Test of Global vs. Articulated Thinking: The Figure Location Test. GREB No. 74-9P, June 1978.

Echternacht, G. Alternate Methods of Equating GRE Advanced Tests. GREB No. 69-2P, June 1974.

Echternacht, G. A Comparison of Various Item Option Weighting Schemes/A Note on the Variances of Empirically Derived Option Scoring Weights. GREB No. 71-17P, February 1975.

Echternacht, G. A Quick Method for Determining Test Bias. GREB No. 70-8P, July 1974.

Evans, F. R. The GRE-Q Coaching/Instruction Study. GREB No. 71-5aP, September 1977.

Fredericksen, N. and Ward, W. C. Development of Measures for the Study of Creativity. GREB No. 72-2P, June 1975.

Levine, M. V. and Drasgow, F. Appropriateness Measurement with Aptitude Test Data and Esimated Parameters. GREB No. 75-3P, March 1980.

McPeek, M.; Altman, R. A.; Wallmark, M.; and Wingersky, B. C. An Investigation of the Feasibility of Obtaining Additional Subscores on the GRE Advanced Psychology Test. GREB No. 74-4P, April 1976.

Pike, L. Implicit Guessing Strategies of GRE Aptitude Examinees Classified by Ethnic Group and Sex. GREB No. 75-10P, June 1980.

Powers, D. E.; Swinton, S.; Thayer, D.; and Yates, A. A Factor Analytic Investigation of Seven Experimental Analytical Item Types. GREB No. 77-1P, June 1978.

Powers, D. E.; Swinton, S. S.; and Carlson, A. B. A Factor Analytic Study of the GRE Aptitude Test. GREB No. 75-11P, September 1977.

Reilly, R. R. and Jackson, R. Effects of Empirical Option Weighting on Reliability and Validity of the GRE. GREB No. 71-9P, July 1974.

Reilly, R. R. Factors in Graduate Student Performance. GREB No. 71-2P, July 1974.

Rock, D. A. The Identification of Population Moderators and Their Effect on the Prediction of Doctorate Attainment. GREB No. 69-6bP, February 1975.

Rock, D. A. The "Test Chooser": A Different Approach to a Prediction Weighting Scheme. GREB No. 70-2P, November 1974.

Sharon, A. T. Test of English as a Foreign Language as a Moderator of Graduate Record Examinations Scores in the Prediction of Foreign Students' Grades in Graduate School. GREB No. 70-1P, June 1974.

Swinton, S. S. and Powers, D. E. A Factor Analytic Study of the Restructured GRE Aptitude Test. GREB No. 77-6P, February 1980.

Ward, W. C.; Frederiksen, N.; and Carlson, S. B. Construct Validity of Free-Response and Machine-Scorable Versions of a Test of Scientific Thinking. GREB No. 74-8P, November 1978.

Ward, W. C. and Frederiksen, N. A Study of the Predictive Validity of the Tests of Scientific Thinking. GREB No. 74-6P, October 1977.